

Sportsman Pilot™



Spring



1981



Sportsman Pilot



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ALL ARTICLES AND PICTURES BY JACK COX UNLESS OTHERWISE CREDITED.

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Mag Check

When in the course of human events one takes it upon himself (and his wife) to strike out on so reckless a venture as to start a new aviation magazine, it is customary to attempt some form of rationalization of the deed . . . lest, I suppose it is feared, some stout fellows in white coats will soon be around to haul you away.

Well . . . all I can honestly say is that I look on my magazine the same way I know you look upon your homebuilts and lovingly restored vintage aircraft. You chose them according to your own desires and preferences . . . you built or restored them with your own hands and with your own resources . . . they are yours . . . you love them . . . and nothing else really matters. I love airplanes, I love flying, I enjoy being around airplane people more than any others and I thrive on magazine work. I've always wanted to do a magazine of my own so I could share this energy and enthusiasm with others . . . so, finally, I'm doing it.

What will **SPORTSMAN PILOT** be about? Just what the name implies . . . of and about pilots who fly for both the sheer exhilaration and calm, intellectual satisfaction they derive from breaking the surly bonds of earth. It will be about the aircraft they fly, the events they attend and the kinds of things they love to sit in the shade of a wing and talk about for hours on end.

When sport aviation is threatened by those who would banish us from the skies, **SPORTSMAN PILOT** won't hesitate to join the resistance. For the most part, however, I plan to stick to coverage of airplanes and airplane people. An optimist by nature, I have no inclination to follow the current trend toward the "selling of bad news". I see the worldwide sport aviation movement as a well-spring of positive good . . . of constructive ideas, of outstanding personal achievement . . . and I intend to call 'em the way I see 'em.

Oh, yes . . . the name. If you are an old-timer or a latter day aviation history buff, you know there once was an aviation magazine named **The Sportsman Pilot**. It began life in the early 1930s, flourished for a time but became a victim of World War II. A very high quality publication, it was noted for its aviation photography, the excellence of which has rarely been equalled and never exceeded. It has always been my favorite old airplane magazine, particularly for its flight test articles which were the prototypes of the genre. I'm proud to tell you that the man who wrote most of them, Franklin T. "Hank" Kurt, became a friend of mine a few years ago. I hope he won't take offense at my dusting off of old bones. Actually, I have no intention of resurrecting **The Sportsman Pilot** . . . I am simply adapting the name (minus the preposition) because I think it is the most appropriate one for what I want my **SPORTSMAN PILOT** to be. **The Sportsman Pilot** had its day and served it well . . . it deserves to rest in honor forever in the archives of the Library of Congress. I will always hold high its standards as a goal to shoot for with my **SPORTSMAN PILOT** . . . but beyond that there is no connection between the two.

Embarking on this sort of adventure . . . in addition to my much more than full-time job as editor-in-chief of EAA's **Sport Aviation** . . . would never have been so much as contemplated without the full support of my wife, Golda. She has been my source of inspiration, my equal partner and my number one cheerleader in all that I have accomplished in my adult life. Together, we're going to give it our best shot.

KALEIDOSCOPE

ABOUT YOUR MAILING LABEL

Following your name on your mailing label is a code — for example, 01-2/82. The 01 is your permanent subscription number, issued in the order in which we received your check. The 2/82 is February of 1982, the month you will receive your last issue of this subscription. Sportsman Pilot is mailed in February, May, August and November. Volume 1, Number 1 is the May 1981 issue, so all of you reading this will have your subscription expire with the February 1982 issue. We'll send you a renewal notice with that issue.

RARE BIRDS

A couple of **really** rare antique airplanes are presently under restoration and will be out battling for trophies soon. In the Grand Rapids, Michigan area the only Lincoln All Purpose AP-K5, an elegant 3-place, high wing monoplane powered by a 100 hp Kinner K-5, is going back together. It is owned by Ron Fritz of Kent City, Cliff Bitting of Grand Rapids and Jack Sheppard, now of Lexington, KY. Ken Fryling is assisting with the restoration — between his Ford Tri-Motor rebuilds. For some reason, FAA has been carrying this airplane on its records as a Lincoln PT-K.

And in nearby Holland, Jack Michmerhuizen has started work on the one and only Fuller-Hammond Twin. A two-place twin powered by . . . are you ready? . . . two 45 horsepower Szekely 3-cylinder radials(!), it was a low wing, retractable weighing only 927 pounds empty. Span was 34' 6" and the wing area was 142 square feet. An 800 fpm rate of climb was claimed, and a top speed of 117 mph. Cruise was 100 mph and the stall came at 40 mph. TWO Zekes!!

ROUND-THE-WORLD RACE?

The only meaningful thing left that man has not done with an airplane is to fly around the world non-stop, non-refueled. Jim Bede was all set to give it a whirl ten years ago in his BD-1 but never got around to the actual attempt. Now, all at once, it seems **everyone** is preparing an aircraft for a try at putting their names in the history books. Five and maybe six serious contenders are known or rumored to be working away: (1) **Jerry Mullens** of Dallas, Texas bought the BD-1 late last year and hauled it to Dave Blanton's shop in Wichita (where it was originally built) for a complete overhaul, updating of systems and installation of new nav/com equipment, including Omega navigation gear. It was rolled out in late March and was in Oklahoma City being painted in early April. The aircraft has been renamed the Phoenix. Its attempts at various world records will be made out of Oklahoma City. (2) **Dick Rutan** and **Jeana Yeager** have

formed Voyager Aircraft, Inc. for the expressed purpose of flying around the world non-stop, non-refueled. Burt Rutan will design the aircraft (we've seen preliminary sketches and it is wild!) and Dick and Jeana will raise the money, build the airplane and, of course, Dick will fly the airplane on the world flight. It will be a two-place twin . . . like **nothing** you've ever seen before. They're looking for a sponsor — and their address is Voyager Aircraft, Inc., 15340 Blackfield St., Mojave, CA 93501. Phone 805/824-4790. (3) Just blocks away in Mojave, **Tom Jewett** and **Gene Sheehan** of Quickie Aircraft are nearing completion of their Big Bird, a composite (naturally) contender powered by a special version of the type certificated 4-cylinder Franklin engine. Big Bird is somewhat similar in concept to the BD-1 in that it will take off from a dolly. Its more advanced construction results in a lighter airframe, however. First flight is scheduled for late May. Tom and Gene are also looking for sponsorship. Contact them at Quickie Aircraft Corp., Hangar 68, Mojave, CA 93501. Phone 805/824-4313. (4) Dave Blanton tells us he is aware of a project in which a Schweizer 232 is being modified, a la BD-1, and powered by a converted VW Rabbit diesel engine . . . and (5) still another 232 modification (no details) . . . and (6) a project in the Atlanta area specifically designed for a round the world attempt. Shades of 1927!

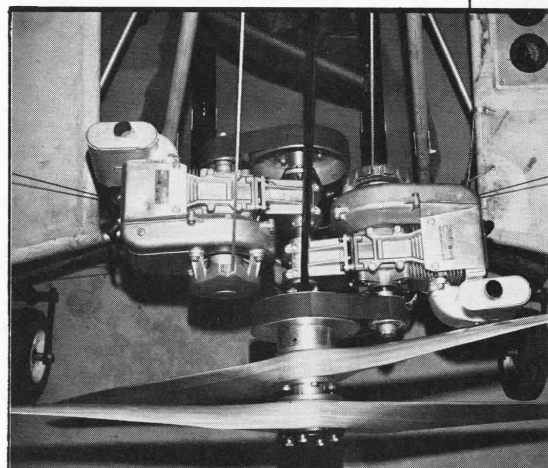
GLASAIR NEWS

The new 150 hp Glasair "production" prototype flew on March 13 and is truing out at 220 mph at 8,000 feet at 2625 rpm. This is with only about 7 hours of test flying. Bad weather about shut down flight testing in late March and early April . . . but the potential of the machine was clearly perceived in the first few hours. This new version of the Glasair flown to Oshkosh last summer incorporates quite a number of refinements. They include a 150 Lycoming with a full electrical system, a tuned exhaust, dynamofocal mount, full IFR panel, "Glasair" embossed rudder pedals, a 3 inch taller canopy with internal hinges (one side slides, the other swings up gull wing fashion), a new trim and flap actuating system similar to the excellent Hiperbipe installation, landing (halogen) and running lights, internal counter weights and a locking tailwheel. The latter works like some of the World War II fighters — that is, stick forward unlocks the tailwheel, stick back locks it. The tailwheel is also 2.5 inches taller to allow better over the nose visibility on the ground. The wing incidence has been changed to allow the Glasair to fly a little more nose down at cruise to improve in-flight visibility. The new bird weighs 920 pounds empty (with a little upholstery yet to go) and gross is 1500 pounds. It's even sleeker than the original, de-

signer Tom Hamilton says. He'll have it at Oshkosh for your opinion. Kit production is presently sold out through June of 1982 — with about 20 per month now being cranked out.

STEWART PRODUCTS CORPORATION

Stewart Products Corporation is the name of a new company just formed by Don Stewart and John Moody. Don is chairman, John is president and Elizabeth Stewart, Don's wife, is secretary-treasurer. The company will manufacture and market all the products formerly produced by Stewart Aircraft Corporation — including the patented Maximizer reduction units and the new Maximizer Twin engine package (see photo). One of the prime purposes for the new company, however, is to market Don's latest design, the Puffin. There is a great deal of interest in this second generation ultralight and investors are being sought to get kits into production. Contact Don at 216/332-0865 or John at 414/878-4380. A monthly Puffin newsletter has been started. If interested, send \$5.00 to Puffin News, 11420 State Route 165, Salem, OH 44460.



The Maximizer Twin

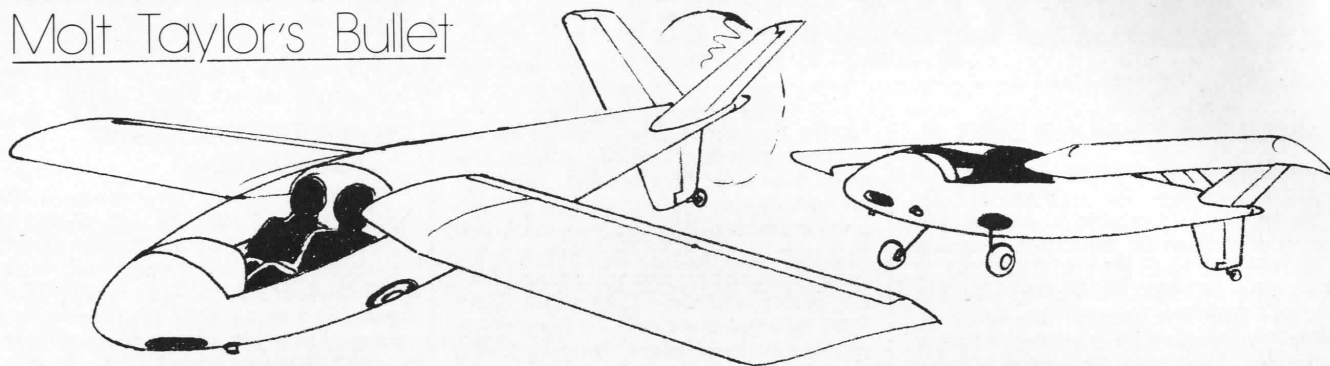
ERCOUPE NO. 1

Ercoupe No. 1 is at the National Air and Space Museum's Silver Hill facility awaiting restoration and eventual display.

WATCH IT, PIPER!

Piper recently named a version of the Aerostar the "Sequoia" . . . and quickly got the word from Alfred Scott's attorney that the name was already taken! Scott's Sequoia Aircraft has been in existence for years now and 17 Sequoia 300s and Kodiaks are under construction. Both names are pronounced the same, so Alfred figures his prior use entitles him to "Sequoia/Sequoia". This is not the first time Piper has been in hot water over an airplane name. In 1949, they named their PA-16 the "Clipper" . . . and got a call from Pan American. The next year an improved version of the airplane went on sale . . . as the Pacer.

Molt Taylor's Bullet



Molt Taylor's at it again! His latest design is the Taylor Bullet — the name is a tip of his hat to the Gallaudet Bullet of some 70 years ago. Like that remarkable aircraft, Molt's Bullet will have its engine, a Revmaster 2100D, mounted in the nose, driving a pusher prop via a fuselage-length drive shaft. To be constructed of Molt's new "paper airplane" process, the Taylor Bullet will be a two-place, side-by-side job. It will be a retractable geared tail dragger with a span of 31', length 18' 9" and a cabin width of 46". The folding wing has a GAPC-1 airfoil and is swept forward 5°. An RC model is now being built to get a handle on flight characteristics.

DAVE BLANTON

Dave Blanton has got to be the busiest man in aviation these days. He is running all over the country installing "slipper" aux tanks on Aero Commanders, has just been contracted by Cessna to build a water tanker out of a Citation to be used in certifying aircraft for flight into icing conditions, is developing a maritime patrol version of the Aero Commander, etc., etc. In between all this he has built a "second generation" ultralight. It is a biplane powered by a 40 hp liquid cooled Zenoah snowmobile engine — which allows him the luxury of cabin heat for winter flying. It has a fully enclosed cabin with "bomb bay" doors to permit foot launching. The airframe is being static tested — to destruction in case of the wings. Extra panels were built for this purpose. It is being rushed to completion so it can be flown at the Beaumont, KS ultralight meet May 16-17.

Dave has purchased a Cessna 150, which will serve as the test bed for the Ford Escort he will soon begin testing on his homebuilt (but very elaborate) dyno. If it works as well as hoped, Dave's son may install an Escort in his Acro II.

BILL TURNER

Bill Turner is beginning work on another full scale replica of a Golden Age air racer — this time a deHavilland D.H. 88 Comet. Ed Marquart is doing the fuselage drawings and a friend with access to a computer has cranked out the ordinates for the wing ribs (every one is different!). The Comet will be built in Bill's hangar on Flabob Airport near Riverside, CA.

TRANS-ATLANTIC ACRODUSTER

Jim Osborne is building one of his Acroduster IIs for an Italian airline pilot — which will be ferried across the Atlantic this summer. An aux tank will be installed in the front 'pit to provide a range of some 1500 miles. The longest leg the plane will have to fly (Iceland to U.K.) is around 600 miles.

DRAGONFLY PLANS COMPLETED

Bob Walters, president of Viking Aircraft, announced recently that the Dragonfly plans had been completed and shipped to his over 100 builders. The prototype Dragonfly has had an engine change. The original 1600cc Monnett VW has been replaced by an 1834cc H.A.P.I. equipped with dual ignition, electric starter, 25 amp alternator, Bendix carb and carb heat. A new engine mount and baffling were also required. 75% cruise speed was increased from 155 mph TAS to 165 mph TAS and the rate of climb went up by about 200 to 250 fpm. The new package weighs 15 pounds more than the 1600cc and, of course, is more expensive. The added performance is welcomed and the safety and convenience of the starter are appreciated, but Bob still maintains that the basic 1600cc VW is sufficient power for the airplane in all but the highest areas of the west. The H.A.P.I. engine was installed in response to the usual requests all designers get for more power — not because of any trouble with the 1600. The Dragonfly is now approved for any non-turbo VW from 1600cc to 1835cc. Maximum engine weight is 160 pounds.

A quarterly Dragonfly newsletter, The Dragonflyer, is now available for \$6.00 per year (\$7.00 overseas), from: Viking Aircraft, P.O. Box 9000, Suite 234, Carlsbad, CA 92008.

CHAMPLIN FIGHTER MUSEUM

Doug Champlin opened his Fighter Museum on January 10 at Falcon Field in Mesa (Phoenix area), Arizona. Intended to show the development of single engine fighter planes of all nations from the start of World War I through World War II, it features the only known flyable Messerschmitt Bf. 109 E-3 . . . with a Daimler Benz engine, the only airworthy Goodyear F2G-1 Corsair, a Hellcat, F4U-1D, FM-2, Spitfire Mk. IX, Curtiss P-40N . . . and the prize of the World War II collection, a real live Focke Wulf Fw. 190D-12! The World War I fighters are full scale reproductions of a Sopwith Pup, Thomas-Morse S-4C, Nieu-

port 27, Aviatik DI, Fokker Dr. I, D-VII and D-VIII. More of both eras are on the way. Open from 10:00 a.m. to 5:00 p.m., Tuesday through Sunday, the Champlin Fighter Museum is located at 4636 Falcon Circle Drive, Mesa, AZ 85205. For further info, call 602/830-4540. Admission is \$3.50 for adults, \$1.75 for children 14 and under.

POLLIWAGEN

Joe and Lucy Alvarez have long since forgotten what the term "spare time" means. During the week they continue to work on an improved version of the Polliwagen for use on the fly-in/demonstration circuit this summer, and on weekends they conduct workshops and seminars on building the Polliwagen. All the structural work on their new bird is complete and they are in the plumbing stage (in mid-April). 5.00x5 wheels have been installed on the mains to allow operation on a wider variety of runway surfaces . . . and gross weight has been upped to 1250 pounds. Polliwagen workshops continue every Saturday from 9:00 a.m. to 2:00 p.m. at Joe's shop at 8782 Hewitt, Garden Grove, CA 92644. However, be sure to call (714/897-9852) Wednesday or Thursday to be sure a given session will be held. Some out-of-town sessions are conducted and, of course, fly-in season is now upon us. Polliwagen plans sales are approaching the 1000 mark and it won't be long before customer-built versions begin showing up at fly-ins. A handsome 4-color information kit on the Polliwagen is available from the address above for \$6.00.

WINGLETS PROVEN EFFECTIVE . . . AGAIN

NASA recently concluded tests of an A-36 Bonanza fitted with winglets. Cruise speed increased by 5.6%, rate of climb went up 6%. Stall speed was reduced slightly and handling qualities were "favorably affected". You can get all the info from National Technical Information Service, Springfield, VA 22161. Ask for NASA TM-81892 . . . and for the price.

WEEDHOPPER C FLOWN

John Chotia flew his new Model C Weedhopper for the first time on April 9. This is a much refined, bolt-together version of the very popular standard build-it-yourself Weedhopper. A new sail has been designed, the wing tips are now enclosed and every angle between component parts is now 90°. Many new, simplified fittings have been designed and incorporated. All metal parts will be anodized.

Weedhopper is unique among the ultralight manufacturers . . . indeed in all of aviation . . . in that nearly 100% of the company's product is built in-house — the airframe, sail, propeller and, most significant, the engine. The latest refinement of the Chotia 460-B, the Square-head, is being fitted with a new carb — also built in-house!

John Chotia recently returned from Europe where he negotiated the Weedhopper distributorship for all of Europe and Africa. He flew a number of demonstrations in Belgium and France and, as a result, was invited to participate in the Paris Air Show.

BROKAW BULLET INCREASED IN CALIBER

Dr. Bergen Brokaw is upping the ante still further for those who want to dispute his claim to the "fastest homebuilt". He is currently installing a Lycoming TIO-541 . . . which the computer says should provide a true airspeed of 351 mph at 24,000 feet!

MILLER TEXAS GEM TO BE KITTED

Jim Miller has decided to come out with a homebuilder's kit version of his Formula One racer, the Miller JM-2 "Texas Gem". This unique pusher was clocked at 233.161 in qualifying laps for last year's San Marcos, Texas air races.

NEW Q2

A new Q2 was rolled out and test flown on April 9 by Quickie Aircraft, replacing their prototype that was severely damaged in a forced landing in late January after a prop blade parted company with the airplane. The new bird, N81QA, utilizes the pre-molded fuselage shells and incorporates a number of improvements. The cowl has undergone a number of changes — but not to improve cooling. The prototype ran **too** cool. The new one has smaller air inlets for lower drag and a cowl flap for cooling during take-off and landing. The main gear axles have been moved forward 2 inches to allow heavier braking and toe brakes have been installed in the cabin. The rudder has been reduced in size by about 2/3. Carbon fiber spars have been built into both the canard and the main (rear) wing, saving about 20 pounds. Empty weight is just 515 pounds, fully equipped. Tom Jewett tells us the airplane looks sleeker than the prototype . . . and will be what customers will get. A very professional, 4-color info pack on the Q2 is available for \$10.00 from Quickie Aircraft Corp., Hangar 68, Mohave, CA 93501.

The Quickie is not being ignored — a turbocharged Onan is being fitted in Super Quickie and plans are to bring it to Oshkosh. Incidentally, nearly 600 Quickie kits have been sold and Q2 sales are rapidly approaching the 100 mark.

TAIL DRAGGIN' ADVENTURE

Over the winter, George Mead has converted his prototype Adventure to a tail dragger . . . and has installed a Continental O-200. The tail dragger conversion took only a week of evenings to accomplish and reduced empty weight by 6 pounds. If you want more info on the Adventure, send for George's brochure (\$5.00) at Mead Engineering Co., Box 354, Colwich, KS 67030.

The first plans built Adventure to fly will be by Johnny Murphy of Cape Canaveral, FL. Johnny really cranks 'em out . . . he has already built a VariEze, Quickie and Long-EZ.

George is currently employed in a hush-hush project — developing an all-composite, tractor engine canard aircraft that is intended to be certified. To be powered by a 160 Lycoming, it is a 4-place job specifically intended to blow the doors off Warriors and Skyhawks. The principal partner in the company is a well known name in general aviation manufacturing. Plans are to display the aircraft at Oshkosh this summer.

RUTAN RACER

Another racer nearing completion is Dan Mortensen's new Biplane Class speedster, designed by Burt Rutan. Based on the Quickie configuration, the racer will be powered by a Lycoming IO-320 (160 hp) and a top speed of 240 mph is anticipated. Constructed of (what else?) foam, glass and graphite, it had to conform to Biplane Class rules — which means wing struts. Otherwise, it is a **very** clean machine. Chuck Andrews is slated to do the initial test flights.

In other Rutan Aircraft Factory areas, Burt has announced that over 500 **Long-EZs** are now under construction. Several are already flying. About 400 **VariEzes** are now flying and hundreds more are getting close . . . so the sight of row-on-row of white fins at fly-ins is going to be commonplace in the years ahead. The Ezes are economical cross-country cruisers whose time has come, it seems.

And ever since **Dick Rutan** set his closed course distance record of some 4800 miles in the Long-EZ prototype in late 1979, we've been waiting for an all-out assault on the record books. He has now built his own modified, high powered Long-EZ and has applied to NAA for a sanction period beginning May 1. The goal is the straight line distance record for C1B Group I aircraft. The present record is 2,795.07 miles . . . but Dick will fly from Anchorage, Alaska to Puerto Rico, a distance of about 5200 miles! This, he says, is just a warm-up for the round-the-world flight.

JIM BEDE'S AUTOCYCLE

No doubt you've seen Jim Bede's 100+ mpg car in Bede Industries' ads. Well, that's not all he's up to these days. The pocket rocket you see pictured here is Jim's Autocycle. It was built up out of the running gear from a Honda 360 motorcycle and is intended to be the ultimate commuter car. The "wings" flip up enough to allow leaning when going around corners. Only one outrigger wheel (from a BD-5) touches at any given time, so the vehicle can be licensed as a motorcycle. The Autocycle will be marketed in the form of a very inexpensive set of plans — and fiber glass body shells. The builder will supply the motorcycle parts and will construct the machine. No timetable yet on when any of this will be available.

Jim Bede's Autocycle . . . what a way to drive to work!

(Photo Courtesy Jim Bede)



NASA Tests The VariEze

In Search Of A Cure For The Stall/Spin Syndrome

On July 27, 1901 Wilbur Wright made history. On his tenth glide of the day he became the first person to enter a full blown stall in a heavier-than-air aircraft at "killing height" and live to tell about it. "Killing height" is high enough to kill, too low to recover. A few days later, on August 9, Wilbur racked up still another "first" — the initial attempt to turn an aircraft with aerodynamic controls only . . . as opposed to the weight shift methods employed by his predecessors. Unfortunately, the 1901 glider in which he was attempting his turn was not equipped with a means to counter what we now refer to as adverse yaw. Fortunately, the result was no worse than still another mouthful of the sands of Kitty Hawk. Lately, Wilbur had been tasting a lot of it.

These were truly momentous events in the history of aviation. Men had been stalling their flying machines before the Wrights began flying . . . and they had been dying for their efforts. Lilienthal, Pilcher and others had paid the price of aeronautical progress in full measure. Finally, however, the Wrights had solved the problem . . . at least within the narrow performance envelope in which they were experimenting at the time. They fitted their glider with a forward elevator because, as Orville would later write, ". . . it absolutely prevented a nose dive such as that in which Lilienthal and many others have met their deaths." In their lightly loaded gliders, the forward or canard surface saved their hides on a number of occasions as they taught themselves to fly . . . gently "parachuting" them down when, for example, they got themselves into a nose high, virtually zero airspeed situation and then encountered a strong gust . . . !!

And although they left Kitty Hawk that year so thoroughly discouraged by the adverse yaw phenomenon that Wilbur dourly predicted it might be "a thousand years" before man learned to fly, the two had it licked within a year. By installing a moveable rudder and tying it into the cables that warped the wings, they were able to make coordinated turns. With this modification of their 1902 glider, Wilbur and Orville believed

they had, at last, solved the control problems of manned flight. The next year they would advance to powered flight . . . and historical immortality.

So . . . what happened to this dearly won knowledge in the years that have followed?

If, indeed, the Wright brothers had developed an aircraft configuration and control system . . . in 1901 . . . with which a properly trained, prudent pilot could reasonably expect to maneuver without fear of stalling and spinning in . . . where did we subsequently go wrong? Throughout the short history of aviation, the stall/spin accident has been and continues to this day to be the number one killer of pilots and their passengers. (It's true that FAA and the National Transportation Safety Board list "weather" as a catch-all cause for most of today's fatal accidents, but that's just antics with semantics — read the accident reports and in most cases you'll find that no matter what caused the pilot to lose control of his aircraft, in the tragic end it was a stall/spin that did him in.)

To a great extent, "what happened" was a direct result of the Wright patents. Other configurations and other control systems were developed in order to get around them . . . then Wilbur died and Orville gradually moved away from aeronautical design . . . then came World War I and the need to standardize machines so great numbers of pilots could be trained quickly and efficiently . . . so that in a little over a decade and a half after the miracle at Kitty Hawk, much of what the Wrights had learned and developed there was forgotten or, at best, considered to be obsolete. Down through the years, conventional wisdom has maintained that the early Wright configurations were simply replaced by better, more advanced ones.

Now, many are beginning to wonder . . . including the National Aeronautics and Space Administration.

A few years ago NASA's Langley Research Center in Hampton, Virginia obtained appropriations to begin a study of the stall/spin problems of general aviation aircraft.

Such a program for military aircraft had been going on since the 1930s, but priorities being what they were, little had been done on modern lightplanes. Initially, the new program concentrated on existing aircraft and a Bede/American/Grumman AA-1 became the workhorse. It sprouted a whole series of tail configurations, wing cuffs, strakes, dorsal and ventral fins, etc., etc. Dynamically similar models were tested in the spin tunnel, free flight radio control models were tested in the spin tunnel, free flight radio control models were put through the same tests as the real airplane, etc. A great deal was learned and, if utilized by manufacturers, will make lightplanes of the future safer than ever before.

More recently, however, the Langley studies have moved on to a different phase — a study of new and/or novel configurations that might prove inherently more stall and spin resistant than conventional (tractor engine, high or low wing, tail in the rear) layouts. One configuration with promise . . . shades of Wilbur and Orville . . . was the canard. The foremost proponent today (or probably **ever**) of the canard configuration is, of course, Burt Rutan, so he was contacted and arrangements were eventually made to test the VariEze in Langley's wind tunnels.

Recently **SPORTSMAN PILOT** visited the Langley Research Center to learn firsthand how the tests were going . . . and to see what was planned for the future. Arrangements had been made to meet with Joe Chambers and Joe Johnson, the NASA scientists most closely associated with the project. Those of you who attend the forums at Oshkosh are familiar with Joe Chambers — he has lectured there on numerous occasions and is an enthusiastic and very knowledgeable student of what is currently taking place in the homebuilt movement.

We were given a thorough briefing on the entire stall/spin program at Langley, including a proper perspective on the VariEze testing. It is an important part of their work, certainly, but is only one of many efforts to make lightplanes safer and more efficient.

The first thing impressed upon us was that some of the test work at Langley is unique to that facility — it's the only place in the world where certain types of experimentation are done.

Spin testing starts, appropriately enough, in a spin tunnel . . . in effect, a vertical wind tunnel. Models are thrown into a rising column of air much like a kid would flip a Frisbee. The force of the air stream sus-

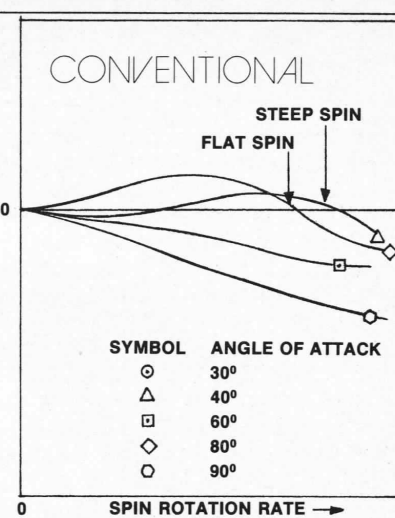
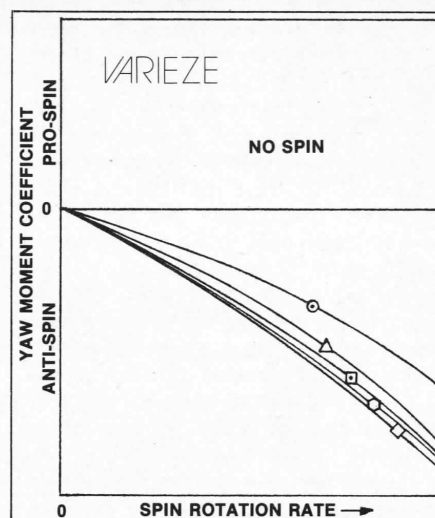
pendes the model right out in front of the researcher so that he is able to observe it closely for hours on end, if need be. Flipped into the tunnel in a spinning motion, the models spin like crazy in their all-but-frictionless state of suspension. These are "developed spins", the type an aircraft would be in well past what is required for FAA certification — spins some full sized aircraft aren't even capable of attaining . . . and the type many could not recover from if they did. Control surfaces on the models are tripped by radio control to try various recovery techniques, etc.

The spin tunnel is also used to do what Langley calls "rotary balance testing". Here a special model is used that is fully strain gauged so that air loads on every part of the aircraft can be measured. The information is fed into a computer programmed to tell researchers what effect any and every part of the airframe is having on the spin — what parts are causing it or contributing to it and what parts aren't. It was here that it was determined that a VariEze, properly loaded, is virtually impossible to spin.

A summary of some of the most important data from the rotary balance tests is shown in the two accompanying graphs. Here the yaw moment (negative for anti-spin yaw) is plotted against a parameter representing the rate of rotation of the spin. Note that the VariEze was damped (anti-spin yaw) for all angle-of-attack values, including the flat spin (90 degrees). The conventional airplane shows a stable steep spin mode at 40 degrees angle-of-attack and a flat mode at 80 degrees.

The reader should carefully note that this plot has nothing to do with departures which can result at stall, only whether the airplane will remain in a developed spin. For example, it has been shown that a VariEze can be forced into a violent departure with excessive angle-of-attack if a vertical fin (winglet) is stalled. However, it cannot remain trapped in a developed spin as the conventional aircraft can.

The "free flight" wind tunnel is a misnomer of sorts. The models tested here are not "free flight" in the sense of the turn-'em-loose-and-let-'em-go jobs the model airplane people fly. These NASA models have an umbilical cord attached to them containing electrical wiring, a compressed air line to drive the propeller, etc. It hangs loose enough that the model can be flown freely within the confines of the tunnel — thus the name. The really fascinating aspect of this type of testing is that



the models are flown by several different pilots . . . simultaneously! One manipulates the elevator control, another the ailerons, another the rudder! That's got to be a weird experience . . . and one requiring some very unique acquired skills. Langley is the only place this is done. It was in this "free flight" tunnel that one of the potential problems of the VariEze design was resolved. In tests at high angles of attack (16°), low airspeed and with extreme aft C.G., a rather pronounced rolling oscillation (wing rocking) occurred.

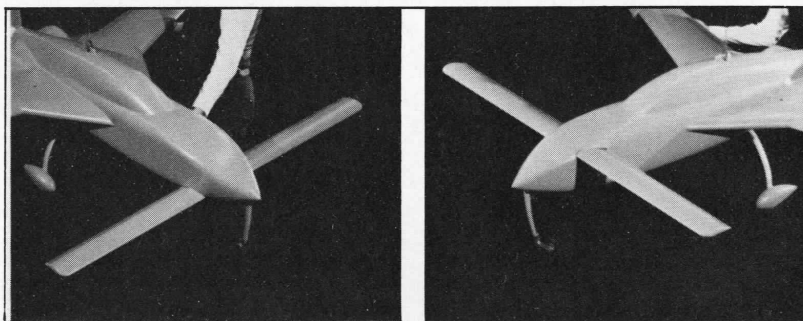
"This is typical of swept wings," Joe Johnson told us, "but in this case made worse by the upwash outboard of the canard."

Experimentation determined that drooped leading edge cuffs of a particular shape and dimension would cure the problem and this information was immediately transmitted to Burt Rutan. The phenomenon had been observed in N4EZ, the prototype O-200 powered VariEze, but only at aft C.G. and only occasionally. It was showing up worse with some of the homebuilder's airplanes, presumably due to various building tolerances. Burt wanted the

design to be completely free of stall departure, so he was very receptive to NASA's suggestion for a solution. Within a very short time he had built and installed a set of 38 inch long cuffs, and had his brother, Dick, do a thorough test flight evaluation of them. Their findings confirmed the NASA wind tunnel tests, so Burt promptly got the word out to his builders, strongly recommending that they add cuffs. Actual experience showed that homebuilder's VariEzes previously susceptible to stall departures were stall proof with the cuffs.

Both Chambers and Johnson were extremely proud of the fact that they had been able to make this contribution to aviation safety . . . and were absolutely amazed to see their work put into actual use so rapidly. Too often, NASA findings go no further than a written report. Liability concerns and certification costs often prevent lightplane manufacturers from taking advantage of what is learned at Langley and other NASA research facilities.

The final stop in the wind tunnel series is Langley's historic old full scale tunnel. As the name implies, full size airplanes are tested here.



NASA is now changing configuration of the VariEze to see if they can improve performance, including lowering canard (left photo).

(NASA Photo)

The thing is a monster — with a mouth 30 feet high and 60 feet across! Built in 1931, it has the distinction of having been in continuous service longer than any other NASA wind tunnel. The hallways outside the tunnel area are lined with photographs of aircraft that have been tested in the big son-of-a-gun and, suffice it to say, the history of aviation — especially military aviation — literally passes before you as you walk by them.

From the wind tunnels, NASA researchers then go outdoors where they fly radio controlled models — with off-the-shelf model airplane radio components — and, finally, the actual aircraft. Spin testing of aircraft is done across Chesapeake

Bay at the Wallops Island facility. A quick ripple through some of the spin test reports reveals some obviously hairy experiences . . . like "Spin became flat. Recovery controls (rudder against, stick forward, ailerons neutral) ineffective. Used recovery parachute." No doubt the event, itself, was just a tad more exciting than the write-up!

But so much for the big picture. Just what, we wanted to know, had been learned about the VariEze? The bottom line came in this comment: "Rotary balance tests in the spin tunnel show the cuffed VariEze is virtually impossible to spin . . . it's a radical improvement over most existing type airplanes."

The VariEze is to be the basis of

an extensive research program on the canard configuration. An extremely accurate full-size VariEze has been built in Langley's model shop (a story in itself) and is currently undergoing testing in the full scale tunnel. Powered by a powerful electric motor and heavily instrumented, it will provide a bank of information that will become the baseline for future experimentation.

Once this is done, NASA will enter still another phase of tests. They will begin to modify the VariEze to determine if they can improve its aerodynamic efficiency. They have already experimented with different canard positions (high, low) and airfoils — and have much more on the way.

We later had a tour of the model shop and saw a Long-EZ wind tunnel model under construction . . . and were told that a full scale Defiant wind tunnel model was to be built. The Defiant will become the baseline for experimentation aimed at improving the safety record of light twins.

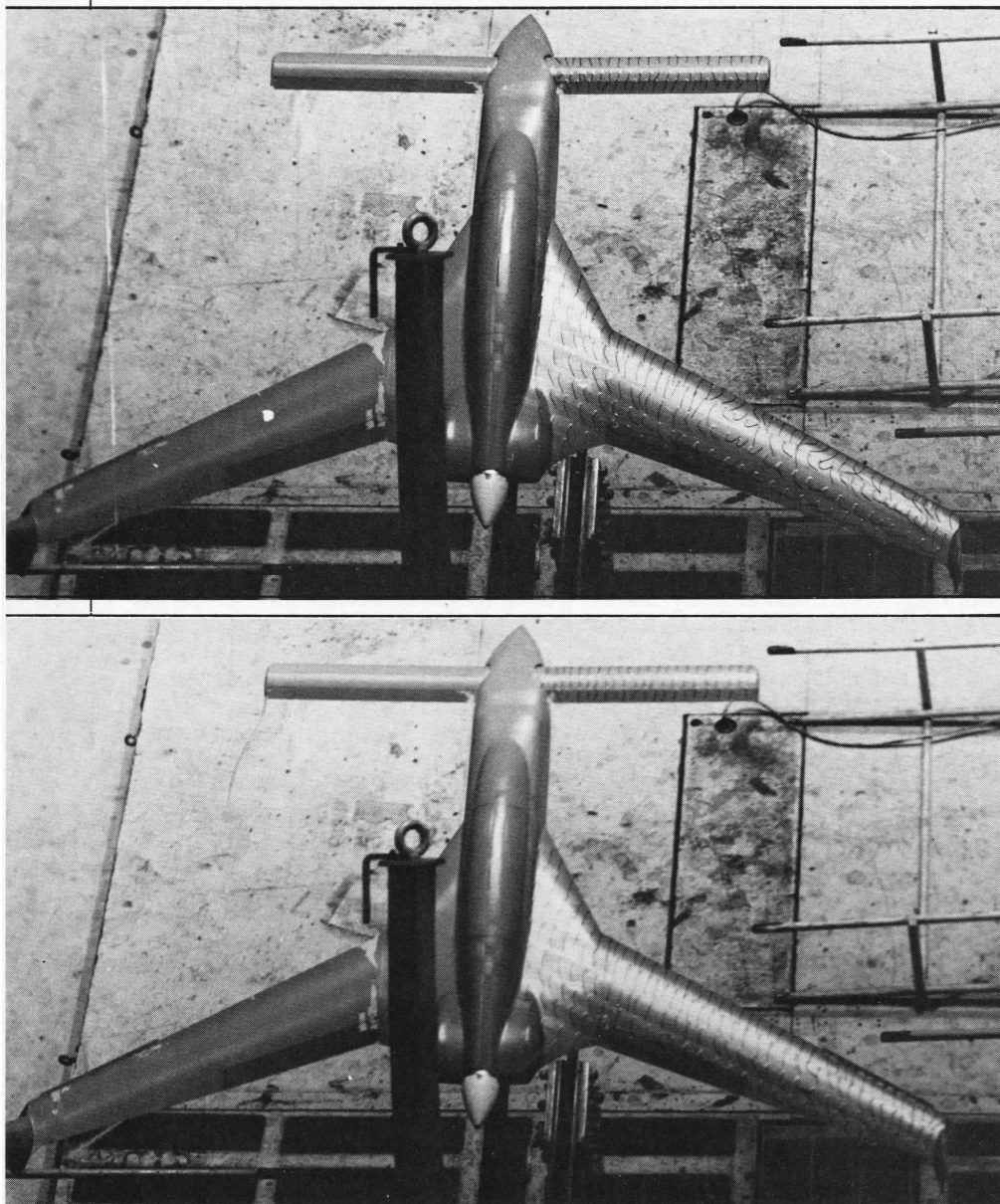
Joe Chambers summed up the day as follows: "The VariEze was our first toe in the water in terms of looking at canard airplanes. It has the potential of being an aerodynamically stall proof vehicle . . . and this is why NASA is interested in it. We think the canard is the airplane of the 1990s."

NASA's general aviation stall/spin program and its aerodynamic improvement program will be in progress for years to come . . . providing Congress continues to fund the work. It is of critical importance to general aviation that these programs continue and perhaps be expanded. Every reader of SPORTSMAN PILOT is urged to take every opportunity that presents itself to inform your Congressmen and Senators of what is going on at NASA Langley and **insist** that funding levels be maintained, if not increased.

A final personal note. Joe Chambers, Joe Johnson, Wayne Oakley of the model shop and others we met at Langley Research Center have been at their work there for many years — Johnson for over 30 years! I've never talked to people more genuinely enthusiastic about their work.

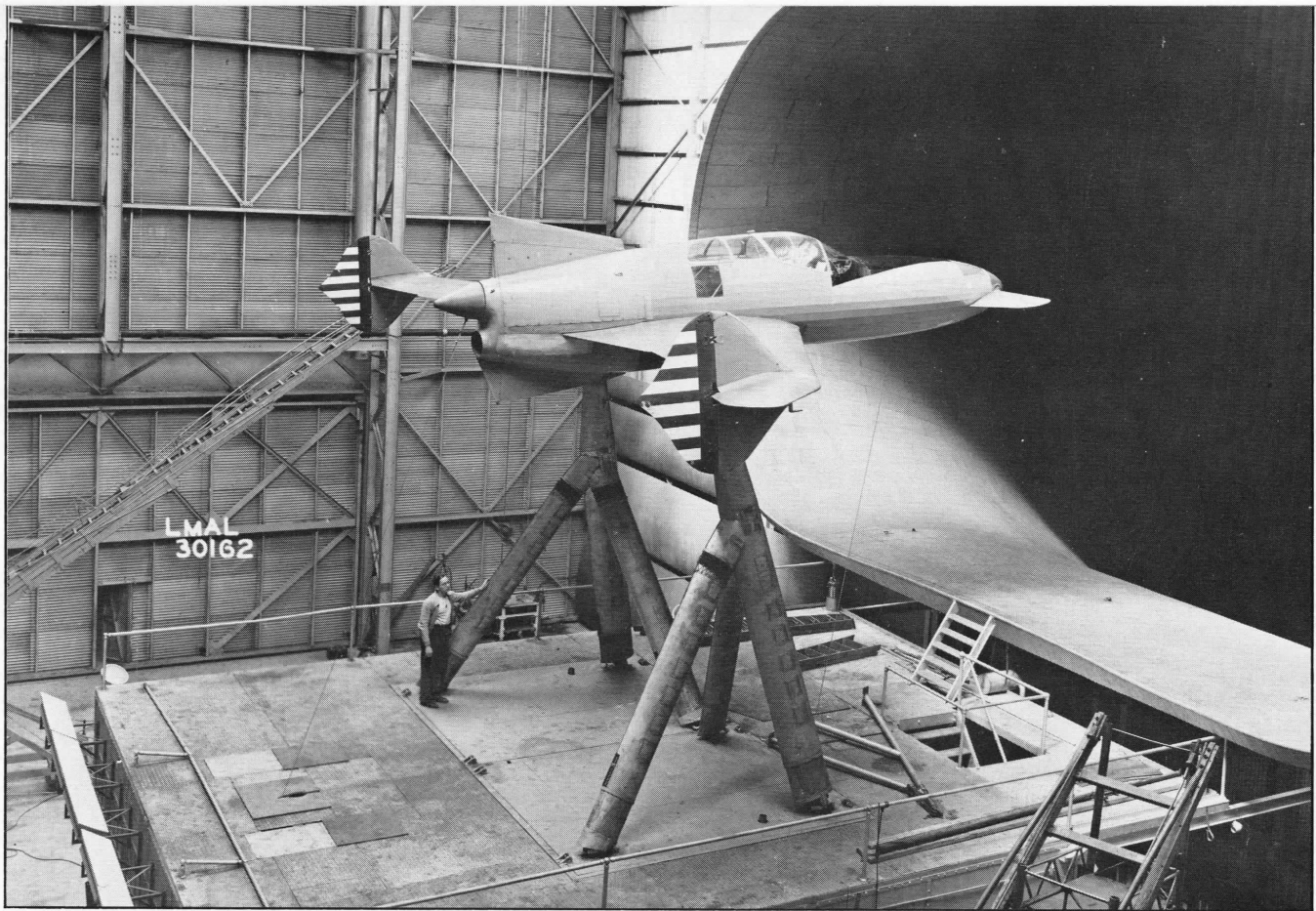
If ever our tax money is being spent for a worthwhile purpose by highly competent, highly motivated scientists, then this is it. We were also in other areas at Langley during our visit and found the same attitudes there . . . but that will have to wait for a future issue. ☐

— Jack Cox



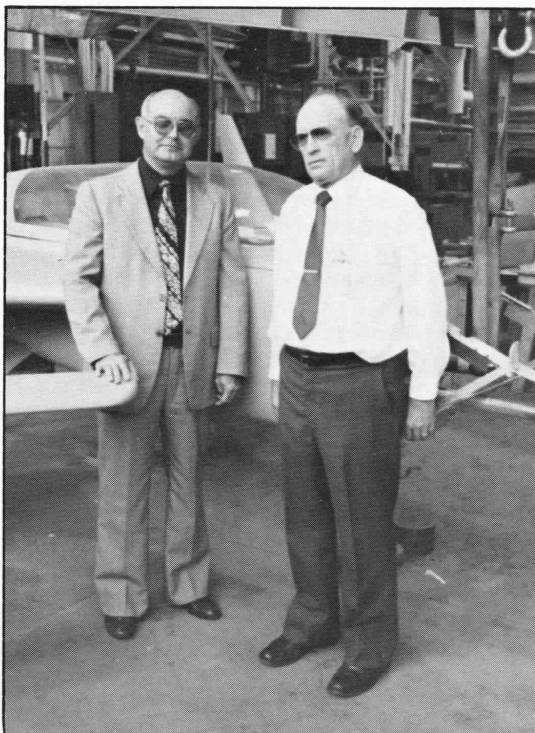
Tufted models show the value of wing cuffs on the VariEze. In top photo, uncuffed wing stalls at 16° angle of attack. Cuffed wing, bottom photo, remains unstalled at same angle of attack.

(NASA Photo)

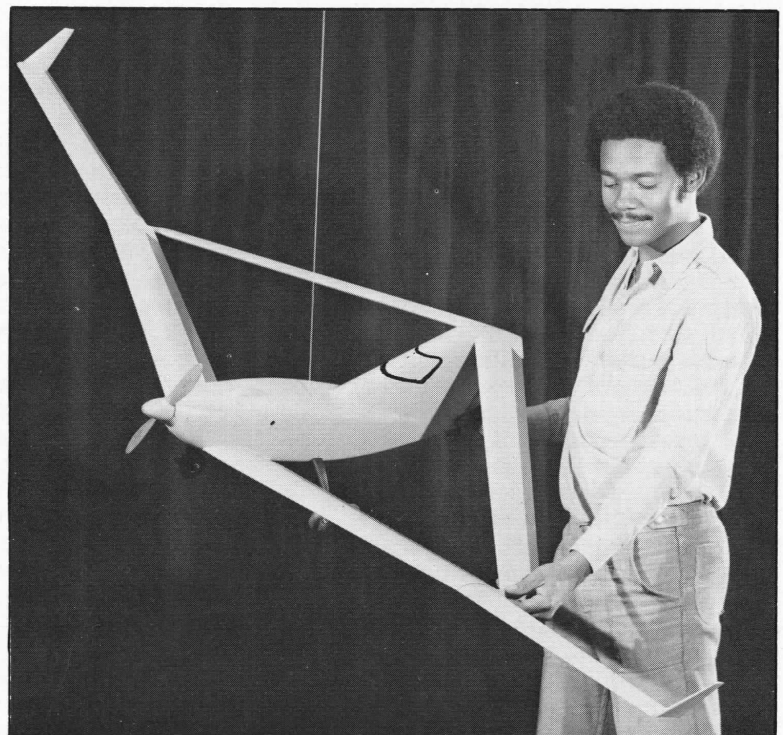


Somewhat ironic is the fact that two similarly configured canards have been tested in Langley's full scale tunnel . . . 40 years apart! This is a very early version of the Curtiss Ascender. The VariEze is, aerodynamically, a far more sophisticated (and successful) design.

(NASA Photo)



Joe Chambers, left, and Joe Johnson, NASA scientists testing the VariEze.



Another Burt Rutan design being tested by NASA is the Predator, an agricultural plane that would accomplish the same work as conventional designs on half the power. It also has better slow speed turn characteristics. Burt was commissioned to do the design by an unnamed group.

(NASA Photo)

GAR'S AW IS A-OK



"It flies just like a heavy Luscombe," he said. "Come on down and try it."

That was all the invitation SPORTSMAN PILOT needed to set in motion a mad dash to the airport and a subsequent 30 minute flight from Milwaukee to the Chicago suburb of Naperville to see Gar Williams' newly-restored 1928 Cessna AW. For an ol' Luscombe lover like me, he couldn't have chosen a more appealing analogy to extol the endearing charms of his latest aeronautical treasure. He also owns a couple of Luscombes and knows how I go into automatic drool every time I'm in sight of 'em!

Gar is well known to all you antique buffs as the craftsman responsible for one of the most beautiful and authentically restored Cessna Airmasters to ever grace the sky. He's flown it all over the U. S. and has a house full of trophies and awards to show for his efforts. Like most antiquers, Gar does extensive research into the history of each of his projects — not only the airplane itself, but also the company, the designer and even the life and times of the nation into which the airplane first saw the light of day.

It's part of the fun of messin' round with the Golden Oldies.

Since the Airmasters were the evolutionary end of a line of fabric covered, cantilever winged monoplanes extending back to the Model A prototype of 1927, it was only natural that Gar would become interested in the ancestors of his 1940 Airmaster. There were a whole passel of 'em, but the AW of 1928 had a particular appeal. That model was powered by the 110 horsepower Warner radial engine . . . and it just so happened he had a garage full of them. In the course of collecting enough 165 Warner spares to "last me the rest of my life", as he puts it, Gar had also picked up a bunch of 110, 125 and 145 stuff. He had the makings of an engine, so why not try to scare up an AW airframe to restore?

Why not, indeed!

The first step in his quest was a visit to my office at EAA to look at the FAA microfiche listing of all U. S. civil aircraft. It didn't take long — there were only a half a dozen early (pre-Airmaster) models listed. Subsequently, he wrote to everyone on the list offering to buy their airplanes.

One of the owners who answered his letter was a Braniff 747 captain from the Dallas/Ft. Worth area. His old Cessna was a Wright J-5 powered BW registered as N6442, Serial Number 138. He had purchased it a half dozen or so years before in Midland, Texas where it reportedly had been stored since 1932. Willing enough to talk about the BW, the owner was not, however, interested in selling. He planned to restore it and had, in fact, already begun cleaning up the fuselage.

Gar, nevertheless, persisted, exchanging letters with the gentleman for about a year . . . and then one day the fateful message arrived. Sadly, for personal reasons the BW had to go. A price was mentioned . . . and before the day was done, Gar had a deposit winging its way to Texas.

The retrieval of the Cessna is one of those stories antiquers love . . . as long as it doesn't happen to them. As an employee of a major airline, Gar has a pass to fly all over the place — but still has to be back at work on Monday morning. Consequently, he planned to retrieve his prize over two weekends. He would drive his car and trailer down to

Texas one weekend, leave it with friends and fly home. The following weekend he would fly on a pass back to Dallas, load up the airplane and drive home to Illinois.

The hotbed of antique activity in the Big D area is Justin Time airport. Gar called a friend who lives there, Dick Hardin, and made arrangements to leave his car for the week. Dick was happy to oblige . . . but was curious about just what sort of treasure Gar was intending to liberate from the Lone Star State.

"A Cessna BW," Gar volunteered.

"Oh no, there aren't any of those around here," Dick assured him.

"Well, it turned out the airplane was just 13 miles from where he lived," Gar recalls — with a devilish grin. "Dick was very pleasant about it when I got there but there were antiquers in the area who were very upset that I had snatched an airplane right out from under their noses."

Once home, Gar launched right into the project. An inventory of what he had whisked away from the Texans revealed some incredibly good fortune. The metal parts were in extremely good shape. The steel tube tail surfaces simply needed cleaning up and some paint before cover, and the fuselage was even better. Apparently, the previous owner had meticulously hand sanded it from stem to stern and had preserved all that effort by applying a liberal coat of zinc chromate. The biggest job Gar had to tackle was chopping out some tubes at the rear of the fuselage that someone, somewhere down the line had added . . . in accordance with ancient factory supplemental drawings . . . to install a tailwheel. Gar was going back to a tailskid, so out came the extraneous structure.

But then came the not-so-good fortune.

According to Gar, the wing is 90% of any of the old cantilever Cessnas. If you've got problems there, you've got BIG problems. For those of you not familiar with the structural details of the huge hunk of timber that sits atop the fuselage of the early Cessnas, a brief description is in order before we proceed . . . otherwise, you will not fully appreciate the monumentality of what Gar was about to attempt. First, it's big — 40 feet 6 inches long and weighing in at nearly 500 pounds! Worse, however, is the internal complexity. All-wood cantilever wings were not unusual in the 20s. Fokkers had used them since the Big War and that American classic, the Lockheed Vega, was another prominent example. Most consisted of a couple of

deep box spars covered with plywood to form a torsion box. The Cessna wing was, however, a different breed of cat. It had the usual double tapered box spars bridged by ribs and compression members — but torsional loads were handled by a veritable cat's cradle of drag and anti-drag wires . . . double sets at the top and bottom of each bay. In the center section, 14 inches separated the top set of wires from the lower ones! (One doesn't need the services of an A&P to work on this thing . . . a cabinet maker who moonlights as a piano tuner would be more appropriate!)

This construction method allowed Cessna to cover its wings with fabric instead of the usual plywood.

Only after uncovering his wing did Gar **really** know what he would be doing with all his spare time and vacations for the next five years . . . minus one. Mercifully, the big front spar was in good shape, but the rear one was pretty badly damaged — apparently from hangar rash rather than an accident. The boom was really lowered, however, when Gar began inspecting the ribs. Every one of them was broken . . . every single one! Between the left and right halves, he was able to salvage an example of each different size (remember, this is a double-tapered wing) to use as a pattern. A complete set of new ribs was manufactured and fitted to the spars. Further, both laminated tips had to be rebuilt. Only the hardware was useable as it came from Texas.

To get all this back together accurately, a very elaborate jig had to be built . . . fortunately, Gar owns a rather large hangar . . . and provision had to be made for turning the monster over during the reconstruction. A lash-up incorporating his chain hoist was devised so Gar could flip the wing over unassisted — and it worked every time but once. Working alone one day, he gingerly hoisted it up and was just about to ease it over center when the mechanism slipped. A desperate grab netted Gar nothing more than a two finger grasp of a $\frac{3}{8}$ inch bolt — but it was enough to hold the wing in a precarious balance. He could hold it there, but he couldn't pull it back down. If he turned loose, the wing would jack-knife into the hangar floor, smashing itself to smithereens.

The day . . . and the wing . . . was saved by some heart rending screams for assistance and Gar's wife's rush to the rescue! With their hangar only a few feet from their back door, Mary Alice was there literally in seconds.



Gar Williams pushing the AW into his hangar at 9 S 135 Aero Drive, Naperville, IL 60540.

Now, folks, all this reads easily enough, even with an amusing anecdote thrown in for comic relief. In real life, however, it wasn't very funny at all. Gar Williams is as intelligent and conscientious an antique airplane restorer as you can find, but the rebuilding of the AW wing was such a horrendous undertaking that after 4 years of it, he was completely burned out. One day he simply put his tools down and walked away . . . for the entire year of 1979!

He wasn't sick of airplanes — just the AW. That year he moved to the other side of his hangar and completely restored a Luscombe 8A he had found sitting forelornly a few miles from his home.

So multifaceted is the story of this restoration, that we have jumped over quite a bit in order to relate the problem with the wing in the proper sequence. We must go back almost to the beginning to pick up the thread of some equally interesting happenings . . . one of which turned out to be a detective-style investigation worthy of the intellect of a Sherlock Holmes.

First, however, we must introduce a new player to the plot. In the course of his historical research on his Cessnas, Gar had made the acquaintance and had become good friends with Eldon Cessna, son of Clyde Cessna, founder and namesake of Cessna Aircraft Company. Eldon was there and intimately in-



involved in the development, marketing and racing of the early Cessnas. Still very much interested in aviation and possessed of an astounding memory, he was to become Gar's invaluable advisor on the project.

Now, as you will recall, the airplane Gar bought from the 747 captain was a Cessna BW, N6442, Serial Number 138 . . . or was it?? (You've probably been wondering how the BW became an AW, right?) Well, there were no data plates, N numbers, etc., with or on the airframe when Gar bought it — but, as yet, he had no reason to question its registration. Then one day as he was stripping varnish off the wing's interior, he came across what was obviously a factory stencil on the rear face of the main spar. It was faded and not easily readable, but could be made out as "20-3-8". The last two digits were offset from the "20" as if affixed at a different time. Gar copied them down and mailed them to Eldon at his home in El Segundo, California. The reply was prompt — the "20" meant serial number 20 and the "3-8" was the month and year of manufacture — March of 1928.

It wasn't that simple, however. Cessna had begun its numbering system for the cantilever monoplanes with 112. "20" was actually 120 . . . which meant the 9th airplane off the production line.

So, what was with this Serial Number 138 business??

Getting back in touch with the previous owner brought a part of the answer. When purchased in Midland, there were no records with the airplane — no numbers of any sort. The 747 driver had a picture of a BW — N6442, Ser. No. 138 — so, finding that number available on FAA's books in Oklahoma City, he applied for and obtained same.

Gar, now convinced he had Serial

Number 120, N4725 instead, cancelled the old one, re-applied for Ser. No. 120, etc., and received same.

Are you sure you have all that straight? There'll be a pop quiz at the end of the article, you know.

O.K., now to the engine. With the airplane came a Wright J-5 . . . in several baskets. This was why the previous owner had registered the aircraft as a BW — that model had come equipped with the J-5. (The same basic airframe had been certified with a variety of engines, each with its own model designation — AA, AW, BW, etc.) Right off, Eldon was insistent that Gar not use the J-5. It made the airplane nose heavy, he said, and was of sufficient diameter as to severely restrict forward visibility. "Use one of your Warners — make it an AW," he advised. Practical considerations aside, he pointed out, the AW had quite a lot of history behind it — which would be impressive in the records Gar would ultimately be presenting judges to authenticate his restoration. AWs had won a number of races, including transcontinental events, and one was even flown to Siberia and back.

There was no getting around it — the airplane had to be restored as an AW.

The 110 Warner engine was built up using the best of the parts and pieces from half a dozen engines Gar had collected over the years, plus some new stuff he had on hand — bearings, bushings, pins, etc. All tolerances were to new specs. Nevertheless, a few modifications were made in the interests of reliability — heavier 145 Warner valves were installed, but the weakest set of valve springs Gar could find were fitted to them. The 110 has a history of breaking its valve train parts, caused, Gar believes, by valve springs that were too stiff. When normal wear occurred, the small

amount of slop allowed the tight springs to exert stresses in directions they weren't meant to, ultimately resulting in a failure. With his weak springs Gar will restrict his rpms to avoid valve float as a tradeoff for, hopefully, no valve train breakage.

The old Scintilla mags also came in for some modernization. The original outer cases were retained but much later — and more reliable — internal parts were installed.

When Gar ended his one year hiatus in early 1980 and began working on the AW again, the major structural members — the big parts — were essentially rebuilt. What remained was covering and attaching all those zillion small things that go on with tiny little screws . . . probably the least-liked part of any restoration or homebuilt project. Here, Gar was aided immeasurably by a purchase he had made in 1977 — a legitimate Cessna AW (Ser. 196). He had heard a rumor at Blakesburg to the effect that there was one in Connecticut in Stafford or Stamford . . . and owned by a square dance caller. When he returned home, Gar got out his atlas and looked up the two towns. Stamford was a good sized college town; Stamford was just a typical small town, so it just seemed more likely that a square dance caller would live there.

Now, as you've seen, hard core antiquers are pretty good detectives — and the following is a perfect substantiation of that claim. Late one night, Gar picked up his phone and called the Stamford, CT police department. After convincing the duty officer he was sober and this was not a crank call, he asked a couple of pointed questions.

"Do you know anyone in Stamford who likes old airplanes . . . and is a square dance caller?"

"Oh, you mean Don Swift."

Nothin' to it folks . . . just takes a little brass and a lot of imagination.

Gar called this Don Swift and, sure enough, he was the owner of an AW and, yep, it was for sale. Gar bought it and has used a number of components off it on Serial Number 120. The complete landing gear assembly from 196 was utilized and its Hamilton Standard ground adjustable propeller made the Warner installation possible for 120. Further, all the wood parts in the fuselage of 196 were used as patterns to make new ones for 120.

Finally, the day came when it was time to cover up all those years of work. In keeping with the covering practices of 1928, Gar used Grade A cotton . . . but stopped a little short of using all nitrate dope. The clear coats are nitrate, but butyrate color coats cover up that highly inflammable material.

"I had no choice in what color to paint the airplane — all the early Cessnas were red," Gar recalls. He contacted Neil Carlson of Randolph Products for assistance in determining the exact shade of red Cessna used in 1928. Neil has in his personal possession all the color charts from the old companies of that day, so was able to zero in on Cessna Red in short order. It turned out that the color was a dead ringer for the Pontiac Red Randolph stocks today.

"If you are satisfied with being 99.9% authentic, then I recommend the Pontiac Red. The difference between it and the original isn't worth the trouble to mix a special batch," was Neil's considered opinion.

Gar agreed to accept the Pontiac Red, but still had a problem in his efforts to have the airplane as authentic as possible. The originals were finished in just 4 coats of dope — 2 clear and 2 of color.

"That would result in a finish about like three ought sandpaper — and I just couldn't end up with something like that . . . after all that work."

Gar appealed to Eldon for a solution — and got still another benefit from his experience and prodigious memory.

"Well, just consider it a show airplane — we used to spiff 'em up a bit when we took 'em to the big shows."

So, a "show" plane it is. You can see the tapes and the weave in the fabric, but there is a gloss to the finish. Cessna painted the entire airplane with dope in '28, even the sheet metal — but Gar used Randolph's acrylic lacquer on his and it matches perfectly with the doped

surfaces.

Eventually, the day came when the FAA had to be called in to make the new/old bird legal for the first time in nearly 50 years. Gar's restoration work sailed by with flying (pun intended) colors but a couple of paperwork snags were encountered. The AW was built without the kind of firewall we are accustomed to seeing today — it has something like a splash shield, an aluminum sheet between the engine and mount. FAA didn't like it, but after seeing substantiation that this was the way the airplane was certified in 1928 (ATC 72), they gave it a reluctant stamp of approval. They would not, however, go along with omitting the "N" in the registration number. The airplane left the factory wearing 4725 — this was before the days of even the old "NC" prefix. Gar agreed to paint on N4725. He also had to install new metal-to-metal seatbelts — but is still looking for the original Nicholas-Beazley belts. If he finds them, they will be installed WITH the new ones . . . one for authenticity, one for the FAA.

In the late '20s, Cessna bought its hardware from, where else, the local hardware store! Things like brass and blued screws, brass safety wire, brass hose clamps, etc. The specialized "aircraft" stuff was obtained from Nicholas-Beazley, a sort of early day Wag-Aero or Aircraft Spruce and Specialty. Gar was able, through a lot of searching around, to obtain much of the small stuff at hardware stores . . .

and a lot of the more specialized items from outfits that supply the antique automobile trade.

A number of parts were made by Gar — the pins in the control surface hinges and the landing gear, for example. The originals were not clevis pins but, rather, long pins with cotter pin holes in each end. Gar cut his from chrome moly rods, drilled them out and had 'em heat treated and cad plated.

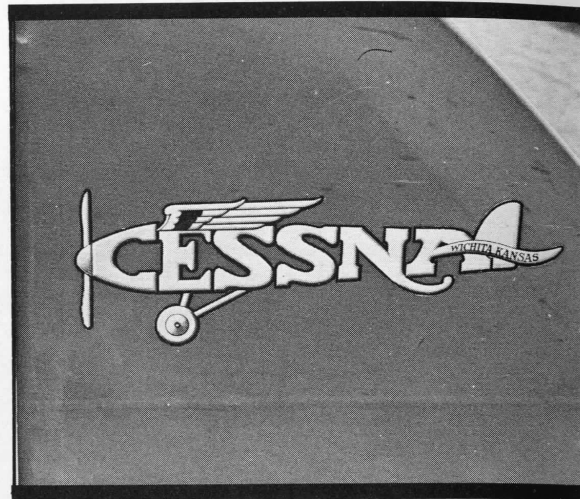
In discussing the upholstery, we need to recall that the divisions of labor were a little wider in 1928 than today. Airplanes like the AW were expected to be purchased mainly by business concerns, so the boss-man was provided with rear cabin seats of then popular grayish-green mohair . . . while his chauffeur/pilot had to make do up front with a more spartan Fabrikoid seat covering. Gar was able — again through the antique auto suppliers — to match the mohair and very closely approximate the Fabrikoid (a plastic impregnated cloth). Sometime after it was installed, Eldon Cessna visited Gar and spent several hours very closely inspecting the AW. His only comment on the substitution for the 52 year old Fabrikoid was . . . "The weave is a little too close together." (!!)

Gar says if he is that close on the authenticity of his restoration, he must be in pretty good shape!

The AW's wheel and brake assemblies are what have come to be known as "Jenny" wheels — 26x4 clincher, spoked jobs made by Kelsey-Hayes. Cessna made up brakes

This is what you see over the nose of the AW on final approach . . . in this case to Naper Aero Estates where Gar lives. He lands the AW on the grass just to the right of the pavement. This is a pretty flat approach for a 1928 airplane — must have been quite an adjustment for biplane pilots of the era.





by modifying 1925 Model T mechanical units and incorporating them (the internals) by means of adapter plates to the wheels. Gar followed the procedure precisely. A friend in Minnesota found the rear end of a 1925 Model T out in the woods somewhere, got the brakes out of it and did the machining necessary for Gar to install them on his Jenny wheels. The slick tires are still made by an outfit in Pennsylvania — but don't come cheaply.

A real problem area involved the door handles and brake arms. They were aluminum castings on the originals . . . and Gar was unsuccessful in finding any. As a last resort, he machined the parts on a lathe, polished them, then sand-blasted each so they would look like castings.

Gar's trial by wood and tube and fabric and ancient engines finally ended on January 24, 1981. That day he flew the AW for the first time. No serious problems were encountered and he has been piling up time ever since, working out very minor bugs . . . mostly in carburetion . . . as he goes along.

Although offered the opportunity to fly the ol' bird early in March of this year, I refused. It would be a callous disregard for the years of incredible labor — not to mention our friendship — to unnecessarily risk the AW before Gar has a shot at the trophies at Oshkosh this summer. I did, however, enthusiastically accept a right seat ride and the opportunity to do a few turns to feel out the control system.

The Warner is not equipped with a starter or even a primer, so hand propping can be quite an exercise in cold weather. When it's really frigid, Gar removes a couple of plugs, squirts in some gasoline, replaces the plugs and starts swinging the big Ham Standard. It was in the 40s the day we flew, so it fired

right up after some pumping on the lever-type throttle as the engine was pulled through.

Gar is very careful to avoid putting a side load on the tail skid as he taxis — and when going from grass to pavement and vice-versa. The skid has a replaceable pad and judging by the wear it has already experienced, will probably have to be replaced prior to Oshkosh . . . but he doesn't want to have to repair any structure before then.

Acceleration on the take-off roll isn't exactly breathtaking, but the tail comes right up and the lift-off comes before you really expect it. Gar had the prop blades pitched too flat at the time we flew it — it allowed 100 rpms over redline on climb out. Even throttled back to the proper numbers, however, it was obvious the thing was climbing at a rapid rate. The nose wasn't very high, so the AW seemed to be sort of levitating in a rather flat attitude. When we leveled out for cruise, it became obvious why . . . just like a Luscombe, the AW cruises with its tail high. The nose comes down so low that the view ahead is quite good for a radial engined antique. Without a speed ring, you can see a lot **between** cylinders.

At 1850 rpms the AW indicated about 100 mph — roughly 10 mph less than it should when the prop is properly pitched, according to Gar.

Taking the controls — the AW is fitted with sticks — I tried a few turns. The elevator was about as expected for such a long fuselaged ol' bird — well damped aerodynamically and fairly heavy when actuated. Trimmed out, the AW just bores holes in the sky with very little in the way of pitch change, even in a little chop. The rudder was not as expected. It is effective, but requires more pedal travel than you would expect for what it does. The ailerons

were the surprise — a very pleasant surprise. Most airplanes of the 1920s and early 1930s I have flown frankly have lousy ailerons — stiff in feel and rather ineffective. The AW's are fairly light and are quite effective.

When you bank into a turn, however, it quickly becomes obvious that in 1928 Cessna had not yet introduced the aileron and rudder to each other. Banking to the left, the wing wants to keep going right on over! And even when you feed in enough right stick to stop the roll, you have to sit there stomping on lots of top rudder to coordinate the turn. To the right, you have to lead with the rudder and keep it turning with it — and coordinate with aileron. It's all rather awkward at first, but something we've found (with other old airplanes in which we have more time) that one can quickly become accustomed to. Like most planes of its era, however, you certainly don't want to stall in a turn in the AW at low altitude.

Over the years, the author has pointed out a hard fact of life concerning old airplanes that bears reiteration here: most airplanes built before World War II WILL stall and they WILL spin. To be certified, those aircraft had to recover, **HANDS OFF**, from a 6 turn spin within two turns. And since airplanes were capable of such gyrations, pilots were required to initiate and recover from spins . . . in fact, not just recover, but recover on a prescribed heading, to the right and to the left! In spite of such training, however, the stall/spin fatality rate was quite high prior to 1940 — largely because too many got into spins too low to recover. In the very late 30s and after World War II, designers began limiting up elevator travel, interconnecting controls, etc., to lessen the light-plane's propensity to stall and spin . . . and, consequently, took the

spin training requirement out of the private pilot's curriculum. The message, then, should be obvious: if you are a pilot trained in the past 20 years or so and have never done spins, you better find an instructor who can teach you before you get involved with antique airplanes. The old birds are wonderful machines; they are beautiful, nostalgic, excellent investments and all that, but if you aren't properly trained and don't give them the respect they demand, they'll bite you, no question about it.

Gar Williams and others like him will never try to pass themselves off as Super Pilots, but when you check into their flying backgrounds, you'll find them DIFFERENT than yours, if you are a recent pilot. Gar, who is 44, soloed in 1953 when he was 16 — in a 115 hp Super Cub. He bought his first airplane a couple of years

later — a J-3 — and has subsequently owned a succession of tail draggers — particularly Luscombes. He restored a number of them — including a complete rebuild of a Meyers 145 and the Cessna Airmaster he currently owns . . . all this **before** getting around to the AW. The Computer Production Manager for United Airlines in its home office in Chicago, Gar lives at Naper Aero Estates, an airport community just west of the Windy City. He and his wife, Mary Alice, have two children, Gail and David. The children, in fact, got Gar into antique airplanes. They started coming along during the time he owned the 2-place Meyers, so he began looking for an economical 4-place with good performance. The Airmaster filled the bill . . . and the rest can be learned by reading the inscriptions on his many plaques and trophies.

Epilogue

The author can recall a time when conventional wisdom had it that the days of all wood, one-piece, cantilever winged antiques were definitely numbered. Who had a work space big enough to handle 40 foot wings? Who would spend the time and money to build a complicated jig and rebuild such a wing, knowing that the bills would far exceed the value of the airplane when finished? (They were, you see, selling for a couple of thousand bucks — or less — licensed and flying 20-25 years ago!!) "Naw, don't fool with those old Cessnas, Kari Keens, Vegas and the like; they're good for nothing but kindling wood," we used to say.

Well, we never dreamed of the prices antiques of all types bring today . . . and we wouldn't have believed there were craftsmen around with the perseverance of a Gar Williams.

I'm glad we were wrong.

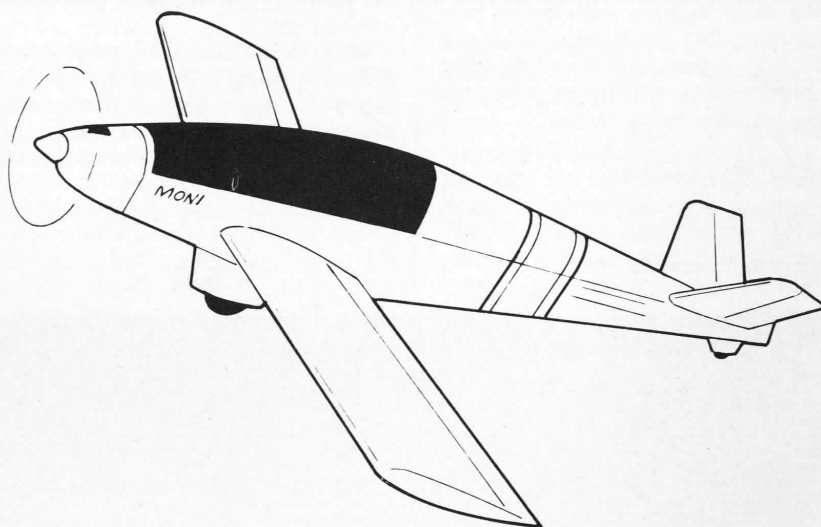
ON THE COVER — Gar Williams pulls through the 110 Warner of his 1928 Cessna AW.



John Monnett's Mystery Engined MONI



Bridging The Gap Between Ultralights And Homebuilts



Here's your first look at John Monnett's MONI, an exceedingly handsome little sportplane you can fly as an ultra economical airplane . . . and, at your pleasure, shut down the engine and soar for free on solar energy. Tailored specifically for the energy scarce '80s, the MONI is the third in a series of "modular" designs, incorporating a unique extruded aluminum spar and metal-to-metal bonding of most of the structure. The building technique was developed for the wing of John's earlier eleven meter self launching sailplane, the Monerai. It was later used on the one-off Monex, a high performance VW powered single placer (that also served as the test bed for a simplified method of building an all-aluminum fuselage). These techniques were further refined to develop MONI.

The airframe is large where it needs to be — in the cockpit — and small where a reduction in size can result in a savings in weight and/or drag. The high aspect ratio wing has a span of 27.5 feet, a chord of 33 inches and a resulting area of 75 square feet. At a gross weight of 500 pounds, the wing loading is 6.67

pounds per square foot and just 5.9 at a gross of 445 pounds (250 pounds empty + 170 pound pilot + 25 pounds of fuel, oil, candy bars, etc.). The pilot will be seated in a standard sailplane attitude — which means about two notches up from being flat on your back. Your head is up just enough that you can see ahead between your knobby knees. The position is great for comfort and withstanding G loads, but mostly it allows a drag-cheating shallow fuselage. MONI measures just 32 inches from the bottom of the fuselage to the top of the canopy. (The fuselage is 14 feet 8 inches in total length.)

As you can see in the drawings, MONI is a pleasing blending of light airplane and sailplane features. The long wings have full span flaperons that function as 1) ailerons with a 2 to 1 differential, 2) flaps for steepening the landing approach, and 3) reflexed upward, to add a few miles per hour to cruise speed . . . or in sailplane terms, increase penetration when you're trying to go cross country.

The landing gear will raise a few eyebrows among powerplane pilots.

A single strut extends out of the bottom of the fuselage to serve as a mounting point for a 10.5 inch diameter wheel and tire. There is no provision for shock absorption other than the tire, itself. A generous fairing streamlines the gear and, ultimately, the trailing edge may be hinged to act as a sort of clamshell airbrake. Each side will pop outward to create drag. For operation on grass, Hoerner-like fiberglass wing tips will serve as tip skids, but when flying off pavement, outrigger skids can be plugged into sockets built into the wings at about 1/3 span. The tail-wheel is also enclosed in a streamlined fairing.

John (and other sailplane pilots) says that it's easier to land with this sort of gear than any other type. You just fly it on and pop the stick forward enough to keep it planted there. Obviously, it is a low drag configuration and weighs less than conventional landing gears. Try it, you'll like it, John promises.

MONI's V-tail is a proven unit that traces its ancestry to the Monerai and Monex. A mixer unit allows the movable surfaces to double as elevators and rudders — "ruddervators" in engineer's parlance.

Key to the success of MONI will be its engine . . . but I can't tell you any more about it than the fact that it will produce about 22 horsepower and swing a 36 inch propeller. The engine was designed from the drawing board up for aircraft use and will be formally introduced this summer at Oshkosh. Until perhaps about June or July, it must remain a "mystery engine". Just another compelling reason to be at Oshkosh this year!

When SPORTSMAN PILOT visited Monnett Experimental Aircraft in Elgin, Illinois in early April, the MONI prototype had reached the point you see in the accompanying pictures.

It's being worked on full time, so will be nearing completion as you are reading this. It is scheduled to make its fly-in debut at Oshkosh in August.

Performance figures are, quite naturally, a product of John's calculator at this point, but he's been at this airplane designing long enough now to be able to pretty well hit 'em on the nose. He projects a top speed of 130 mph, a stall of about 40 mph and a 400 fpm rate of climb. The glide ratio is expected to be around 20 to 1. MONI is stressed for the aerobatics its modest power will permit.

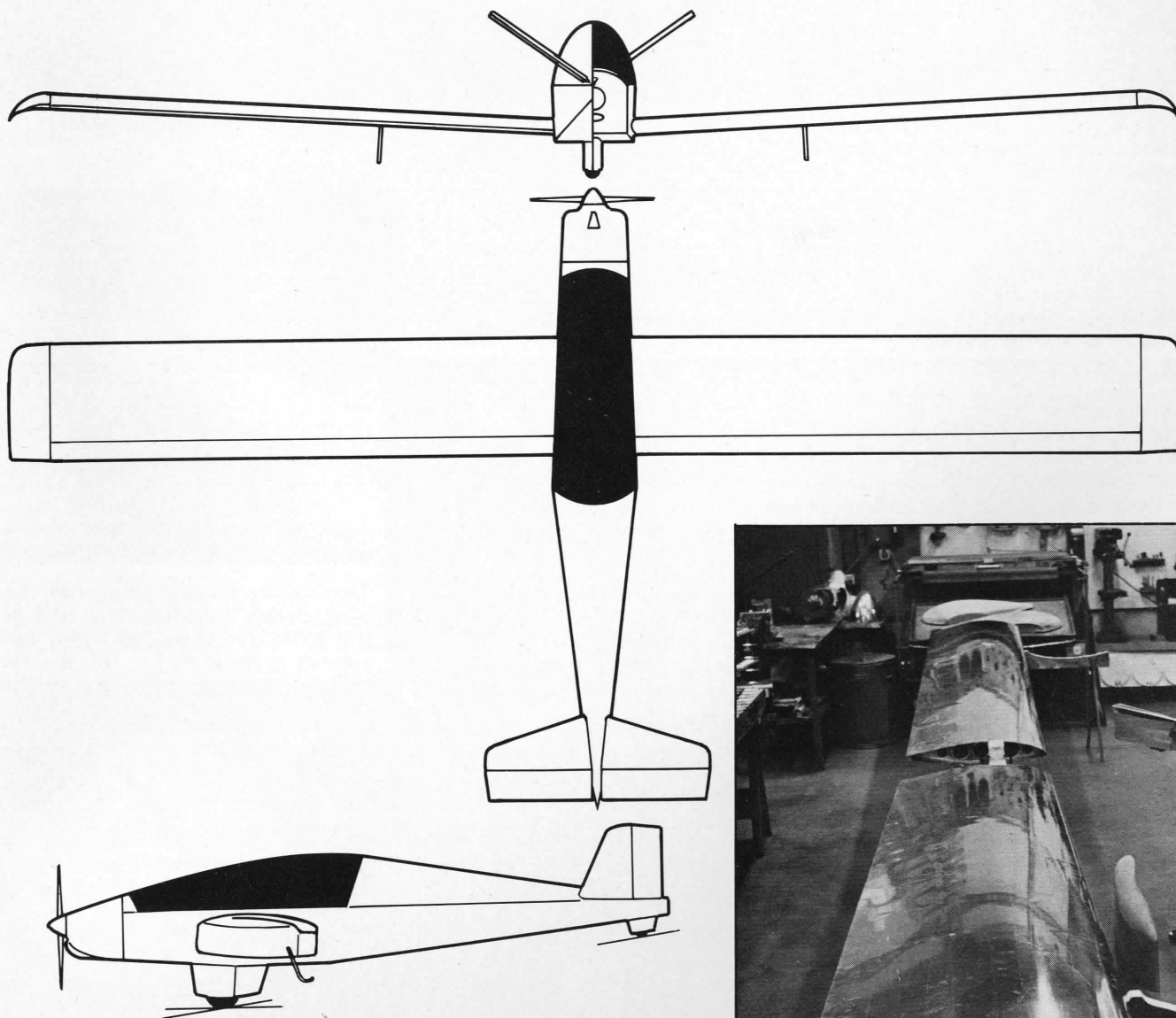
John will market the MONI as a complete kit, including plans for a 16 foot enclosed trailer. A simple dolly will be used to roll the MONI in and out of the trailer and will

support the fuselage while the wings are being pinned in place for flight. This will permit one person to quickly assemble — and disassemble — the airplane. The trailer will double as a camper during fly-ins, soaring meets, etc., and, of course, can be used as the MONI's weather-tight hangar. It will fit in a standard garage or car port — an important feature in light of today's ever-increasing hangar rents.

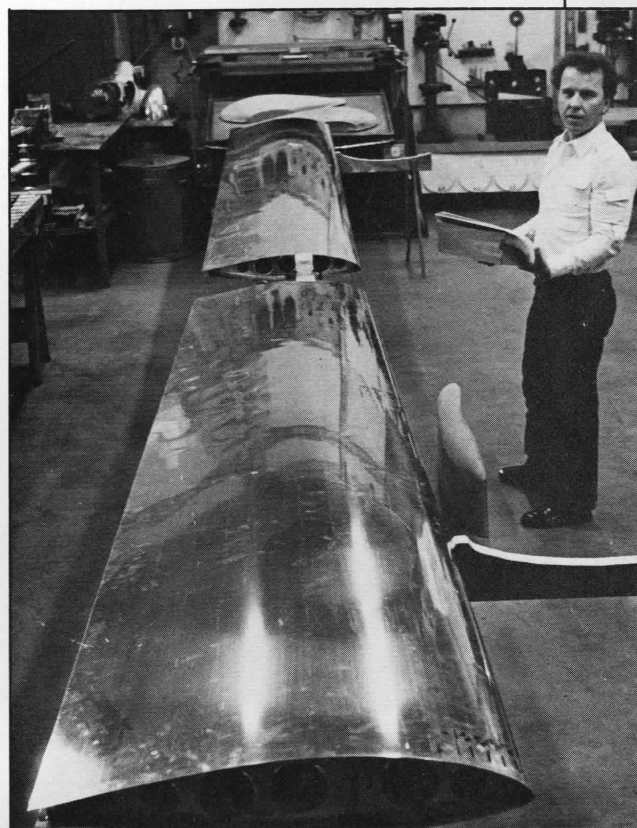
It's a well known fact that most pilots who fly strictly for recreation rarely stray far from their home airport. They like to airport hop, maybe do a few flip-flops now and then but, mostly, they just like to fly . . . just be up there free as the birds. The ability to soar would be an added plus. The only reason more of us don't do this kind of flying is the

expense. We all have family obligations and, for many, it's becoming an act of selfishness to do a lot of fun flying at today's fuel/rental/storage rates. But if one could have access to a little aircraft that cost and operated for about the same as a motorcycle, sport flying would be a much more acceptable proposition. John Monnett's MONI seems to have been designed with just that sort of thing in mind. I think it's going to be a very popular little airplane in the years ahead.

If you want more information on MONI, or any of John's designs, write: Monnett Experimental Aircraft, Inc., 955 Grace, Elgin, IL 60120. He has a very attractive brochure kit for just two dollars.



John Monnett and the 27.5' MONI wings. One-piece skins are bonded on, resulting in a smooth, virtually ripple free surface.



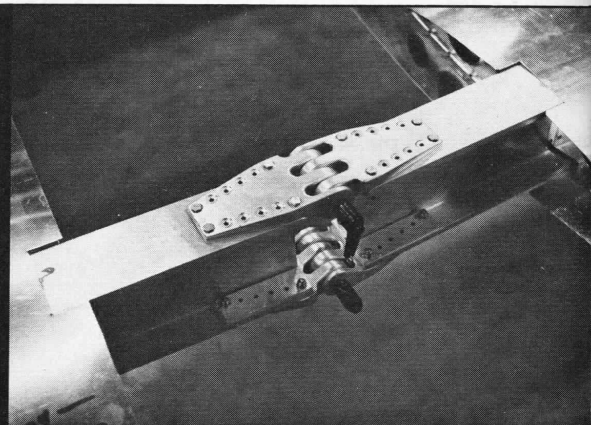
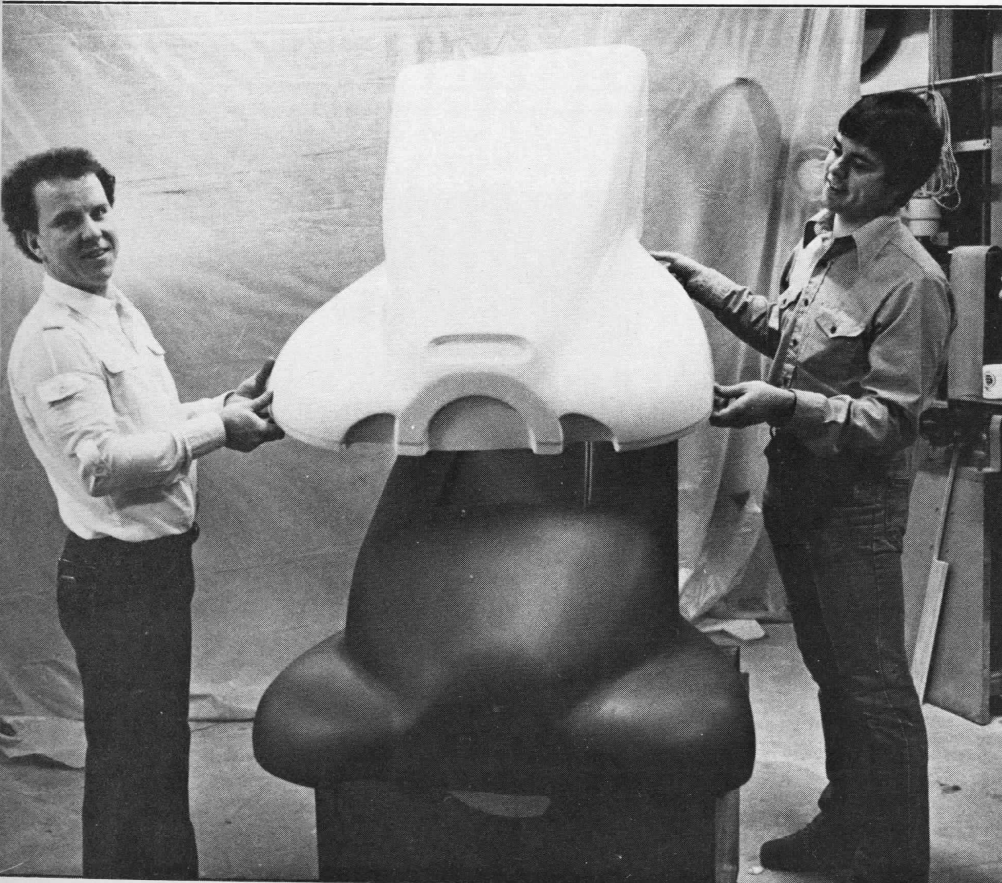


John and Betty Monnett, owners and operators of Monnett Experimental Aircraft.

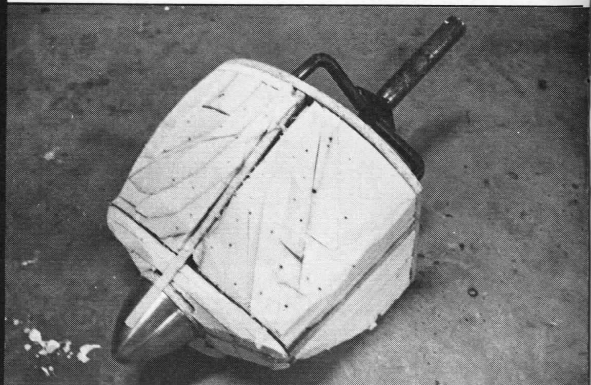


The MONI fuselage in the "boat" stage — shown here upside down on the work table.

John Monnett, left, and Pete Buck hold a standard Sonerai lower cowl over the plug for a new one for the same airplane. Obviously, something new is in the offing. Again, we are sworn to secrecy . . . so be at Oshkosh when all will be revealed!



Two quick-release pins hold the wing panels together. The rest of the bolts are installed when the aircraft is finished . . . of course.



MONI cowling plug in early stages of construction. The "mystery engine" will lurk within the cowls pulled off this plug.

SUN 'N FUN '81



Sun 'N Fun '81 at mid-week. Total registered attendance was 25,000 — up from 18,733 last year.

Sun 'N Fun '81 was the first major fly-in of the new season . . . and may have been a harbinger of things to come, not only for this summer but for all the years ahead of us.

Since the 1980 fly-in season ended last fall, the price of a gallon of aviation gasoline has spurted from an average of around \$1.70 to \$2.00 . . . and it showed at Sun 'N Fun. About the usual number of homebuilts, antiques and classics flew in, but by and large they remained tied down for the week. It was quite windy on several days, which undoubtedly kept a lot of prudent pilots on the ground, but even on the calm days virtually no one flew. I asked a number of showplane owners why and got the predictable answer: "It's just too darn expensive!"

The one person who seemed to be saying "Hang the costs, I came here to have fun," was Jackie Yoder of Midland, Michigan. His 300 hp Barracuda spent more time in the fly-by pattern than anything else . . . maybe more than all the other planes combined.

That's how it was for one half of the fly-in. It was something entirely different for the other half.

The story you're going to read about over and over in reports on Sun 'N Fun '81 will be the ultralight turnout. It was huge! At one point on Tuesday evening, over 30 of the diaphanous creatures were in the air at once. Not since the wild and woolly fly-by patterns of the Rockford days have EAAers witnessed such a glorious (to some), scary (to others) sight. Virtually everyone on the airport was in the ultralight area that evening, and it undoubtedly would have been that way all week had

it not been for the winds. The ultralights stole the show as it was, but their conquest would have been complete had Mother Nature been more munificent.

But . . . having said all that, I now have to beat a hasty retreat back to Square One and concede that most of what I've been describing has consisted of the frosting on the cake. Airplanes and flying are what we expect to see and do at fly-ins, but Sun 'N Fun has still another face. Since its rescheduling into the third week of March, it has pretty well become the chosen site for EAAers to perform their annual Rites of Spring. For those of us who have endured still another winter on the frigid side of the Mason-Dixon Line, the annual trek south to Florida does more to revive our weary bodes than a stiff dose of grandma's sulfur and molasses ever could! The smiling faces of kindred spirits you haven't seen since Tullahoma or Oshkosh boost one's cabin-fevered spirits as no herbal tea or even a dance around a May Pole ever will. I don't care how expensive gasoline gets . . . or how riddled with inflation our economy becomes, sportsmen pilots will find a way to escape winter's blahs and get to Sun 'N Fun. You older heads somehow managed to get to the Miami Air Races during the Great Depression . . . which was a heck of a lot worse than what we're experiencing now . . . so, by hook or crook, we're gonna do it today!

As in every previous year, Sun 'N Fun honchos Billy Henderson and Lyle Flagg and their legion of die-hard local EAAers had made significant improvements to the grounds and in the organization of the event. Since



This beautiful 1952 Cessna 195 is powered by a 350 hp turbocharged Jacobs. Owned by Adrian Smith of Smithtown, NY. Cruises at 210 mph at 25,000.



Mitchell Wing's new P-38.

every one of them is a volunteer who holds down a regular job, I don't know how they do it — but they do. The aircraft parking areas, the workshops, forums, commercial displays, evening programs, the provisions made for folks like the OX-5ers and others, the afternoon air shows and everything else just gets better every year. Their daring decision of a few years ago to stick their necks out and acquire a permanent site for Sun 'N Fun classifies them as financial wizards or, at worst, clairvoyants in the context of today's economy. I hope all you Floridians and South Georgians realize how much the rest of us admire and appreciate your efforts.

Now, most of the airplane talk we intend to pass along will be found in the captions of the photos accompanying this article, so the remainder of my commentary will be devoted to some broad-brush strokes that, I trust, will serve to put Sun 'N Fun into a historical perspective . . . something you can look back at a few years from now and be reminded of how things were back in the early days of 1981.

And that takes us back to the ultralights.

One thing had not changed since last season — the various manufacturers of ultralights were out in force, selling to beat the band! You've gotta give 'em credit, these young (and a few not so young) entrepreneurs are hustlers. They show up in special trucks

and vans loaded to the gunwales with their aircraft, spare parts, fold-up displays, boxes and boxes of 4-color brochures and the ubiquitous info packs. They move right into their rented tents, lay down Astroturf carpets, set up TV sets that continuously run professionally produced video tapes extolling the virtues of their products . . . while the company crew, snappily dressed in identical jump suits, falls in for inspection before they rush out to start greeting (and selling) the public. It's nothing new — it's the way almost everything is marketed in modern America — it's just that we haven't seen that much of it in the sport aviation world. Jim Bede opened the door to the hard sell in the early 70s at Oshkosh and, of course, Frank Christensen has subsequently set the standard everyone else now strives to meet.

I suppose the reason all the rampant commercialism seems just a bit hard edged to some is that while most of us are in sport aviation as a hobby, these fellows and gals are out there earning their living. They're giving their all because they have to eat like the rest of us . . . but, I strongly suspect, are really driven by the realization that unless they are successful, they will soon be back at some workaday job they won't enjoy half as much as flying and selling ultralights.

Personally, I rather enjoy all the hustle and bustle. The free movies are great, I'm acquiring a really neat



VariEzes continue to show up at fly-ins in greater numbers than any other type of homebuilt. With around 20 or so at Sun 'N Fun, nothing else was even close. This very nice example was flown down from Waukegan, IL by Jim Trombino.

Another year, another new Barracuda at Sun 'N Fun! This one owned by Dick Stiles of 5332 River Ridge Pk., Lansing, MI 48917. Powered by a 200 hp Lyc. and a Hartzell CS prop. Empty weight is 1500 pounds, gross is 2300. Stalls at 58, cruises at 190 mph at 10 gph.



collection of brochures and some of the sales pitches are the most imaginative blarney I've heard in years!

One thing is certain — somebody is dropping some big bucks into these promotions. And since most of them have been at it for several years now, they obviously must be turning a profit. As a matter of fact, the ultralight industry has become VERY profitable. Several manufacturers are shipping well over 100 kits or complete aircraft a month and two or three are approaching the 200 mark. Weedhopper, we're told, sold 258 in February alone and is now running three shifts a day in the engine department in an attempt to meet ever-rising demand. John Chotia currently employs over 100 full time people at his Weedhopper works in Ogden, Utah and like Quicksilver, Rotec, American Aerolights, Pterodactyl and probably others is now setting up foreign distributorships. All report that worldwide sales are booming.

The point of all this is that we are well into a revolution in aviation . . . a worldwide revolution. An affordable means of flying for a heretofore undreamed of percentage of the world's population has finally been achieved. People everywhere on the face of this planet are rushing headlong to realize their dreams of personal flight. We receive virtually all the world's aviation publications at EAA Headquarters and most of them now contain ultralight news.

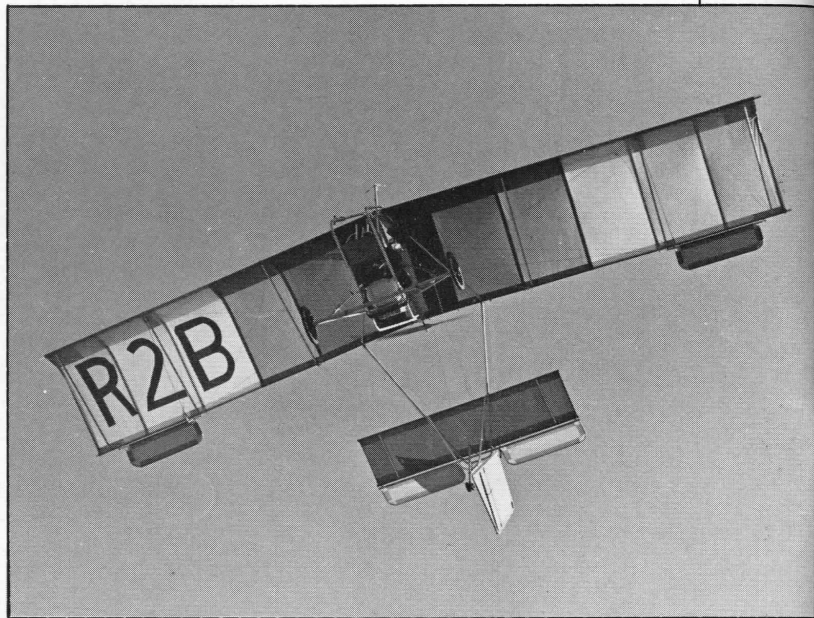
With unit prices approaching or in the four thousand dollar range, it may not be readily apparent to some why ultralighting is as affordable as its proponents claim. If you are the owner of a "real" airplane, however, it certainly is no mystery. Consider this: You plunk down your four grand for one of the ready-to-fly jobs that folds up and stores in a long canvas bag. When it arrives, you suspend it from the ceiling of your garage where it is out of the way of everything else. The only cost is a one-time charge for some hooks and perhaps a little rope. When you want to fly, you lower the bag onto the top of your car, strap it on and head for a nearby farmer's field or vacant lot. You can bring along a couple of cans of gas and a little oil . . . or just a can to siphon a gallon or so of go-juice from your car. After taking a few minutes to assemble your ultralight, you fire up and zip off for an afternoon of fun flying. When you've had enough, you land, disassemble the bird, strap it back on your car, drive home and resuspend it to the ceiling of your garage . . . then go about your business.

Now, when you bought your ultralight, you probably paid sales tax, but in all likelihood that will be the end of your tax obligation. It's not legally an aircraft, so you are not liable for a registration fee in most states. You're using auto fuel, so you are not paying the federal aviation fuel tax (currently 4c per gallon). In



Extremely rare Butler Blackhawk owned by LeRoy Brown of Zellwood, FL. Winner of the Best Antique Biplane Award, the Blackhawk was restored by Bob White of Zellwood. Bob has his own airport and restoration shop, from which he has cranked out 10 antiques in the past 30 months! He also hosts two very successful fly-ins each year — one in May and another the weekend prior to Thanksgiving.

Bill Adaska's ROTEC Rally 2B, one of the first of the full 3-axis controlled ultralights. Bill is a helicopter engineer who has turned his considerable talent to ultralights — and it shows. The Rally's are of very high quality and feature a number of novel mechanical innovations. His centrifugal clutches, for example, are used by quite a number of other manufacturers. Because of the 3-axis controls, a lot of licensed pilots choose the Rally.



the states that tax personal property . . . well, you know . . . "uh, yes, I have a long, er, large aluminum lawn chair, canvas covered and it's worth, uh, er, twenty-five dollars." You taught yourself to fly by taxiing up and down the cow pasture until you got the hang of it, so you incurred no cost for aircraft rental or instructor's fees, no license fees, etc., etc. Again, it's not legally an airplane, so there is no annual inspection. Insurance is up to you — some take it out, others don't. (It would be prudent to at least have liability insurance.)

By way of dramatic contrast, let's briefly run through the major costs incurred by the owner of a "real" airplane in, say, Milwaukee. A used, older Cherokee 140 will cost around ten grand. Insurance (liability only) will run two or three hundred a year, hangar rent (if you can get one) will run about \$100-\$150 per month. The 150 Lycoming will consume about 9 gallons per hour of \$2.00 per gallon 100LL . . . or \$18.00 per hour just for fuel. Oil is \$2.50 per quart and you'll need one every 6 to 10 hours. Your annual inspection will run you around \$400 — providing nothing is wrong with the airplane. If repair work is needed, the going shop rate is 18 to 25 dollars per hour. Parts go for prices you won't even believe.

All this is, of course, assuming you already have a pilot's license. If you don't, count on shelling out

around two grand to get your Private Ticket. You'll need a FAA physical exam that has to be renewed every two years (3rd Class) and you'll have to take a Biennial Flight Review every two years to legally continue to fly. You'll also have to fly regularly to be able to carry passengers (legally) — especially at night.

Expect at least one AD note per year . . . who knows what it will cost or how long the plane will have to be down while it's being done. And, finally, you have to send the state a licensing fee of about \$22.00 each year — for which you will receive a little sticker to affix to the tail of your airplane.

Hit the newcomer in the face with all those "real" airplane costs and bureaucratic hassles and it's easy to see why, for better or for worse, he runs headlong for the nearest ultralight emporium. And, lately, there have been an increasing number of "real" airplane pilot/owners ("former owners" might be more apropos) right on his heels.

Much has been made of the *deja vu* quality of the current situation in aviation . . . how much it parallels the early 1930s when pilot/owners were forced to abandon their beloved Travel Airs, Wacos, Stinsons and the like for more affordable flivvers like Aeronca C-2s and 3s, E-2s, Curtiss Juniors, et al. The principal difference, of course, was that the Great Depression was over in ten years, whereas the energy crunch that cur-

KEN BROCK... That Gyro Guy!



Sun 'N Fun '81 served to remind us that Ken Brock occupies a very unique position in the world of sport aviation. A featured air show performer at Oshkosh each summer, he has been involved with every phase of gyroplane flight since 1957. Ken is said to have demonstrated and taught gyroplane flight to more people and in more places than any other person. He has appeared in scores of movies, TV commercials and TV shows both here in the U.S. and abroad. His 2,000 hours of rotorcraft time includes the first transcontinental crossing of the U. S. in a homebuilt gyroplane — Long Beach, CA to Kitty Hawk, NC in 1971. President of the Popular Rotorcraft Association for a number of years, Ken travels almost anywhere to spread the gospel of gyro flying . . . often dismantling his KB-2 and stowing it in the rear of his Cessna 210 for travel.

Ken is also founder and president of Ken Brock Manufacturing, one of the leading producers of precision metal parts for homebuilt aircraft. He makes the hardware kits (and many larger components) for the Thorp T-18, Marquart Charger, all the Rutan designs and a number of others. His most famous product, however, is his own gyroplane, the KB-2. A Bensen Gyrocopter distributor from 1960 to 1980, Ken began making replacement parts and what he considered to be improvements in various components and systems, i.e., his patented seat tank, his own control system, wheels, airframes, etc. Ultimately, every part of the machine was of Ken Brock design and manufacture. As a consequence, Ken and Bensen Aircraft agreed last year to go their separate ways.

Ken's parts . . . and KB-2 kits . . . have always been known for their superb quality and appearance. Available as a complete kit with a McCulloch 4318 (72 or 90 hp) or the option of a modified VW, the KB-2 goes together in a hurry using only common home workshop tools and equipment. The KB-2 actually comes in the form of 8 self-contained kits that can be purchased separately, if the builder desires. Parts are pre-measured, pre-cut, pre-drilled, pre-shaped, pre-riveted

and welded where appropriate. A 10' x 10' workspace is all that's required to put the machine together, using big 22" x 34" drawings and step-by-step assembly instructions.

Florida is a hotbed of gyroplane activity and a Popular Rotorcraft Association fly-in is held in March in Dunnellon, just prior to Sun 'N Fun. This year, Ken was able to lead a sizable group of gyro pilots to Lakeland at the conclusion of their own fly-in. Ken was performing in the afternoon air shows and they wanted to be there to cheer him on. Gyro enthusiasts are real fanatics and Ken Brock is their Ultimate Hero. It was interesting to watch him taxi in after his performance and be mobbed by his devoted fans!

And speaking of his air show performance . . . it was really something at Sun 'N Fun '81. The wind was howling on two or three of the days, but Ken never missed his turn to fly . . . which was a singularly significant demonstration of the capability of a well flown gyroplane. A lot of people are comparing gyroplanes with ultralights, these days . . . which gyroplane adherents don't particularly appreciate, so it was with no little glee that they pointed to the fact that while Ken was out doing his dipsy-dos, the ultralight crowd across the way was hanging on for dear life to keep their machines from blowing into the next county.

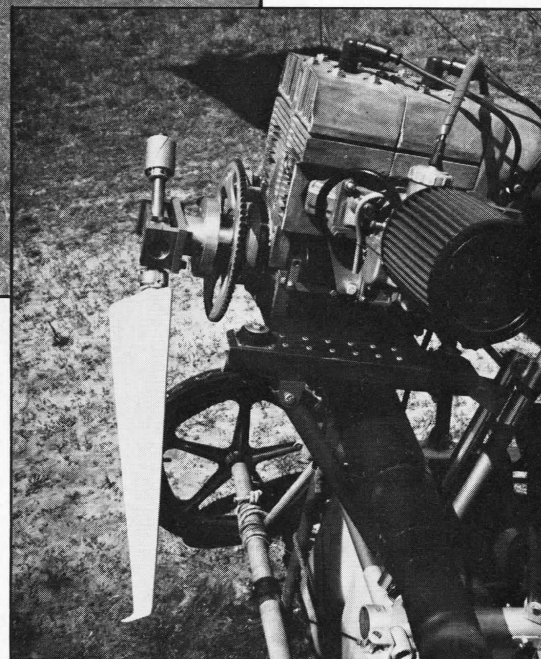
During one show, Ken was doing his dead stick (auto-rotation) landing and was hit with an updraft so strong it stopped him in mid-air and actually began blowing him back up . . . and backward! Both he and several of the aerobatic pilots created some new maneuvers that day!

Ken Brock Manufacturing is located at 11852 Western Avenue in Stanton, CA 90680 (phone 714/898-4366). Stanton is just west of Disneyland and south of Knotts Berry Farm — so if you are playing tourist in that area, why not drop by and look over the Brock's operation. They have a show room in which you can examine their products. Ken has a fully illustrated catalog for \$3.00 and a new info pack on the KB-2 for \$7.00.



Mike Araldi's Stampe, N1037Y — and a PBY Catalina being converted to a corporate aircraft by Cypress Aviation of Lakeland.

Paul Yarnall continues to develop his single blade prop for ultralights. His latest version, mounted here on a Cuyuna engine, has a foam and glass blade weighing only 4 ounces! Note the Q-tip. The effective diameter is 36 inches.



rently has us by the throat may never get any better.

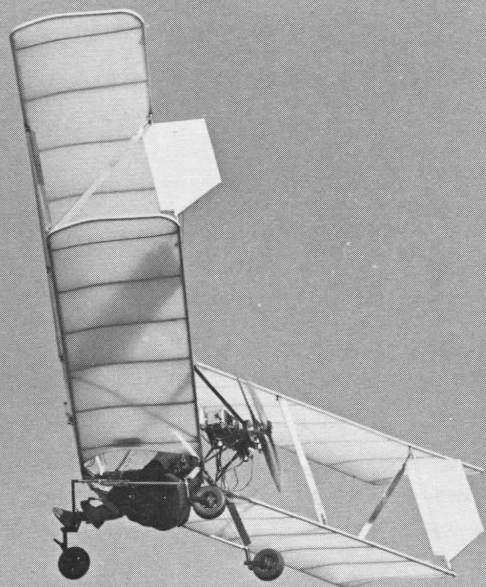
So . . . are we doomed, as some pessimists suggest? Is the end in sight for recreational flying? Of course not. We're just going to have to scale down to less expensive flying machines. Many of us will have to cash in our gas guzzling Wichita Wonders for a sleek, efficient homebuilt, an ultralight or a lower powered classic or antique . . . just as we are having to unload our Detroit iron. Development of homebuilts and ultralights will quickly move towards each other, creating a new generation of super efficient (and super fun) aircraft that bridge the gap between the types we see today. (For a look at what's coming, see John Monnett's MONI elsewhere in this issue.)

Ultralights have an immediate problem that must be solved before their future can be clearly seen. Heretofore, FAA has used foot launchability as its dividing line between licensed aircraft and unlicensed aerial vehicles (hang gliders and powered ultralights). This very liberal ruling has, on one hand, made possible the explosive growth of the movement, but, on the other, has elevated deceit to the status of a Fine Art. Many of the current crop are, indeed, foot launchable . . . while to do so in a few others would require the strength of an adult gorilla, the agility of a prima ballerina and the bow legs of a seven foot tall version of Yosemite Sam!

Don't blame the ultralight designers — they're simply taking advantage of a time-honored business axiom that states that rules were made to be stretched to anywhere short of their breaking point. If they don't like the extent of the stretching, then FAA should change the rules . . . which is precisely what they have been struggling to do for a couple of years now. According to EAA President Paul Poberezny, it appears FAA has decided upon a weight limit as a dividing point to replace foot launchability. We'll probably see an NPRM issued some time this year . . . maybe.

It will be interesting to see how well a weight limit works. With foam and glass composite construction, some pretty wild things can be built with empty weights under 200 pounds . . . things decidedly faster and more demanding of pilot skill than are now being flown by unlicensed pilots. I still think the late Klaus Hill had the best solution: simply set a wing loading of 2.5 pounds per square foot as the dividing line and nothing else will matter. Anything with a wing loading at or below that figure, he believed, would be limited enough in speed and in the winds in which it could be handled, that the craft would be safe enough both for unlicensed pilots and innocent persons and property on the ground. A lot of people say, "Aha! Just wait until I design my 1200 pound aircraft with a span of 300 feet and 3,000 square feet of wing area

Jack McCornack, president of Pterodactyl, transcontinental flyer and free spirit . . . but a responsible one. At the ultralight race near Phoenix in January, he offered the equivalent of top prize money to all Pterodactyl pilots who finished with speeds within the design's safe operating envelope. He has added a canard to the Pterodactyl . . . and, of course, named it the Ptraveler.



John Moody's Easy Riser was declared the Grand Champion Ultralight at Sun 'N Fun '81. This is an old 'Riser — just completely overhauled and recovered in time for the trip to Florida. It is powered by the unique Maximizer Twin pictured in the Kaleidoscope.

and . . . etc., etc." Well, while we're waiting for you to raise the stacks of dollars it would take to build **anything** with a 300 foot wing span and while you are rounding up the crew necessary to walk such a craft out to the runway in anything above a gentle breeze, the rest of us will just get on with the practical craft that would be built under a 2.5 (or thereabouts) pound per square foot limit. (To cut down on future rule stretching, both a wing loading and a weight limit might be a better, more easily enforced regulation.)

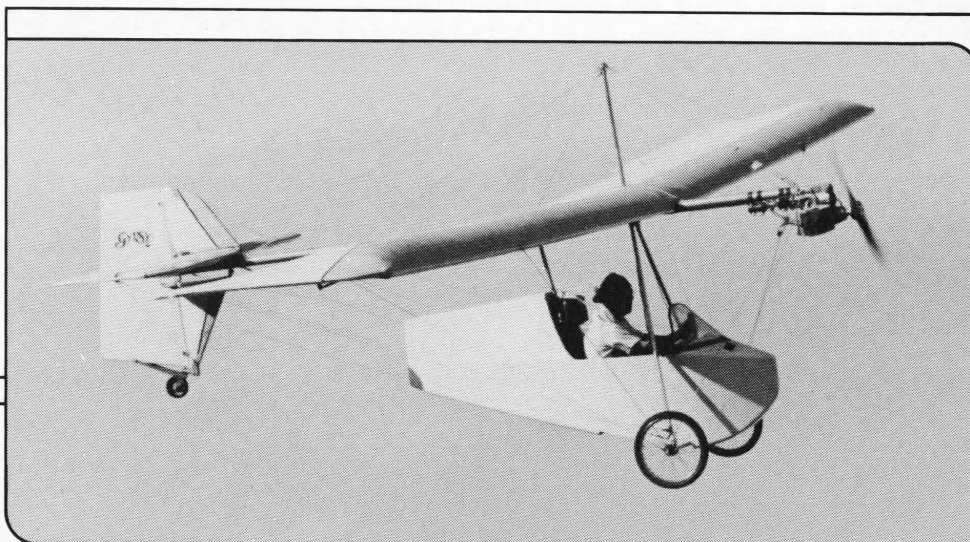
Yes, the pessimists among us may look at the reduced flying activity at Sun 'N Fun as a signal for the start of a decline in sport aviation . . . but I don't believe it. I believe Sun 'N Fun '81 was one of the first recognizable signposts to the future. I think we are on the brink of one of the most exciting and technically interesting eras in aviation history. Adversity, economic or otherwise, always brings out the best in inventors and innovators. Creative people always need challenges . . . and these certainly are challenging times. Even now our designers are drawing up the sportplanes of tomorrow. You certainly don't want to miss Oshkosh this year . . . or Sun 'N Fun '82. ☺



Variations on a Klaus Hill theme. The Mirage, top, Vector, middle, and Hummingbird are outgrowths of the late Klaus Hill's Humbug. Mirage and Hummingbird feature 3-axis control, Vector has spoilers and rudder interconnected.

The Mirage was judged the Outstanding New Ultralight Design at Sun 'N Fun '81.

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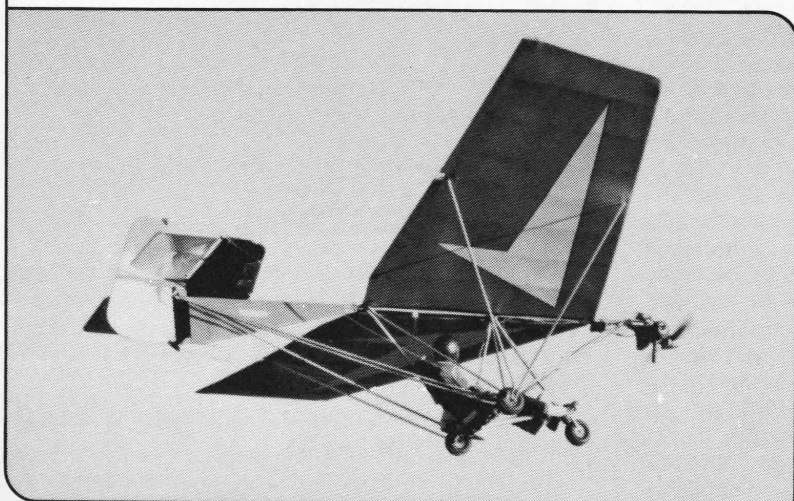
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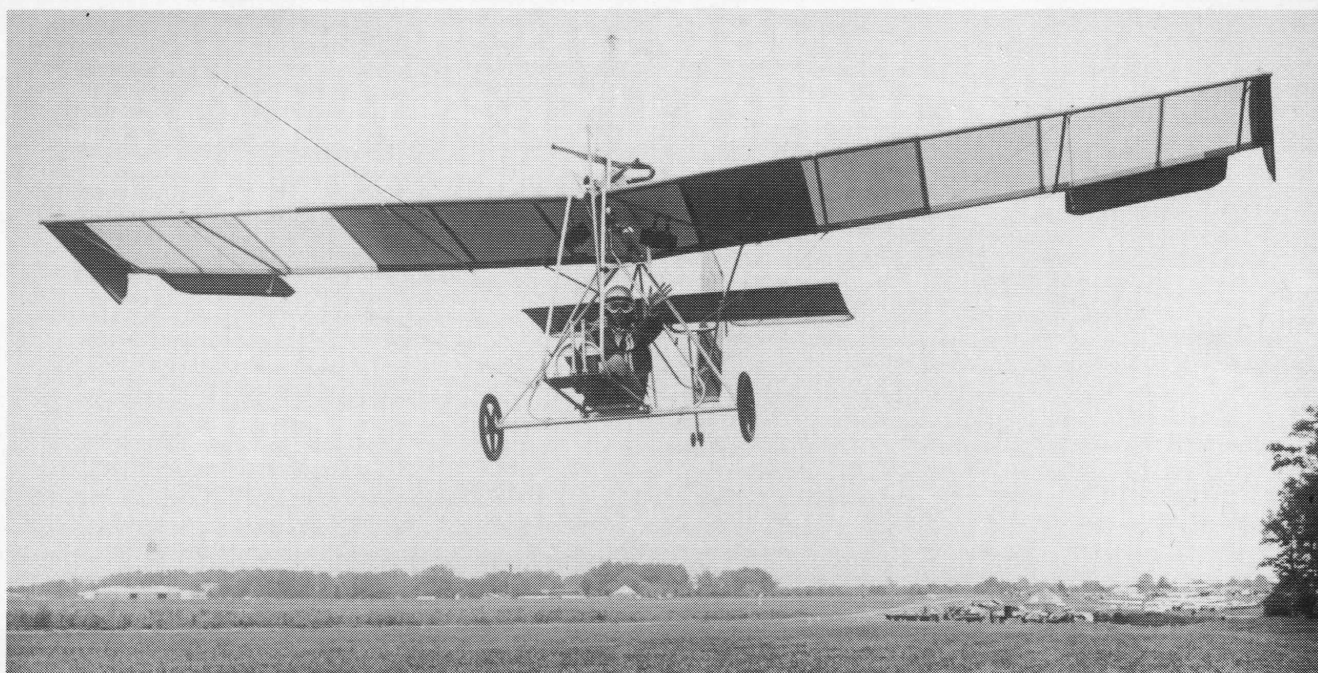
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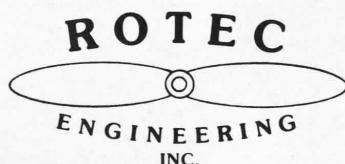
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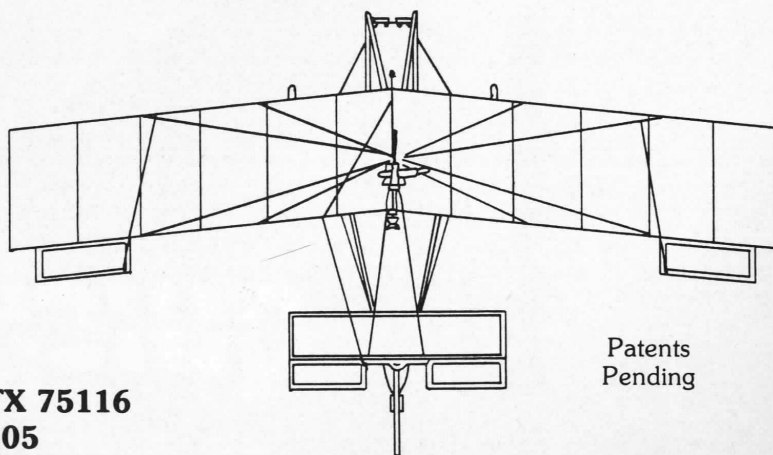
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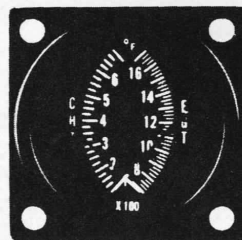
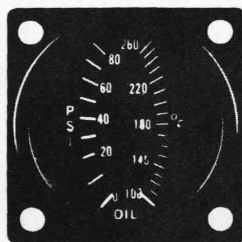
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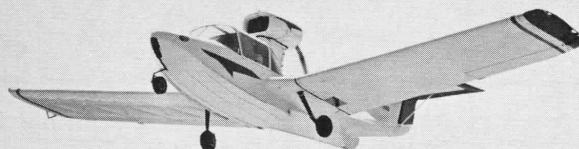
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